

BUREAU OF RECLAMATION WATER CONSERVATION, EFFICIENCY AND MANAGEMENT IMPROVEMENT ACT AND DROUGHT CONDITIONS IN NEW MEXICO

HEARING
BEFORE THE
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
ONE HUNDRED NINTH CONGRESS
SECOND SESSION

ON

S. 2561

TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO MAKE AVAILABLE COST-SHARED GRANTS AND ENTER INTO COOPERATIVE AGREEMENTS TO FURTHER THE GOALS OF THE WATER 2025 PROGRAM BY IMPROVING WATER CONSERVATION, EFFICIENCY, AND MANAGEMENT IN THE RECLAMATION STATES, AND FOR OTHER PURPOSES

AND

TO RECEIVE TESTIMONY REGARDING THE DROUGHT CONDITIONS FACING
THE STATE OF NEW MEXICO.

ALBUQUERQUE, NM, APRIL 19, 2006



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**BUREAU OF RECLAMATION WATER CON-
SERVATION, EFFICIENCY AND MANAGE-
MENT IMPROVEMENT ACT AND DROUGHT
CONDITIONS IN NEW MEXICO**

WEDNESDAY, APRIL 19, 2006

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Albuquerque, NM.

The committee met, pursuant to notice, at 10:05 a.m., at the National Hispanic Cultural Center of New Mexico, Hon. Pete V. Domenici, chairman, presiding.

**OPENING STATEMENT OF HON. PETE V. DOMENICI,
U.S. SENATOR FROM NEW MEXICO**

The CHAIRMAN. The hearing will please come to order. Can you hear me? All right.

First of all, thank you, Senator Bingaman, for joining me in this hearing. For those who are witnesses, I think the staff will keep you posted on the timeliness and necessity for your presence. We will try to stay on a good schedule.

I believe we have a good set of hearings. It's my intention to cover all of it today, and so we will keep the witnesses to their commitments, and we won't let people talk too much today, beyond that which we have agreed upon.

Both Senator Bingaman and I have opening remarks, and I'm going to give mine, plus I believe we have five or six very diverse subjects, even though the issue is water and drought.

Let me open with remarks and yield then to my friend, Senator Bingaman. First, one only needs to look outside at the Rio Grande to appreciate the dire situation we're in. During an average year, this is the time that the Rio Grande will be at its fullest. The flow of the Rio Grande is currently less than half of what it would be at this time in a normal year.

Statewide, this is one of the worst droughts in the past 100 years. In some river basins, this is the worst drought in recorded history. In New Mexico, in some of the river basins, it's the worst. To make matters worse, many of the State's reservoirs that we rely on during times of drought will remain at alarmingly low levels. Elephant Butte, our largest, which provides water to our farmers on the southern Rio Grande, will be less than 10 percent of capacity by Labor Day.

The drought will be particularly devastating to our farmers and ranchers who are already suffering from repeated years of lack of

water and drought years. Unless we have an extraordinary rainfall in the next several weeks, many farmers will receive little or no water from the rivers on which they depend. I think most people know that, but we never appreciate it until the stark reality is there.

Ranchers and dairymen will also be hard hit by the drought. Lack of rain has resulted in less water for herds and below-normal feed production, requiring ranchers to buy feed at increased prices, drill new wells, and to haul water, which certainly is not something they can afford to do for any extended period of time.

In order to provide some relief to our farmers, ranchers, and dairymen, I recently co-sponsored an amendment, which was included in the emergency supplemental appropriation bill, that provides \$4 billion for production losses and economic assistance to agricultural producers. The Senate considers this bill next week.

Although it is very large in terms of dollars, and its title sounds good, I'm not sure how much it affects, in a positive way, our farmers and ranchers. And there may be somebody who might want to tell us how effective it might be, Senator Bingaman.

In addition, numerous New Mexico communities are under severe water restrictions. It is anticipated that municipal water service will be disrupted in some areas. In order to mitigate the effects of drought, we included in the emergency appropriation bill a provision to extend through 2010 the Bureau of Reclamation's Emergency Drought Relief Act. This authority allows the Bureau to secure emergency water supplies for communities struggling with drought. \$7.5 million will be included in the bill for this purpose. We've also included \$5 million for emergency water hauling and well drilling by the Corps of Engineers. In order to help our farmers and ranchers, we also requested \$17 million in emergency drought-related assistance, which includes securing emergency water supplies for agricultural producers.

The current drought illustrates the need to make the most efficient use of the water that we do have. In many instances, relatively cheap infrastructure for water can minimize water losses to a very large extent. For the past 3 years, Congress has awarded efficiency and conservation grants through the administration's 2025 Program. It is estimated that this program has yielded an additional 285,000 acre-feet of water per year through infrastructure amelioration by these grants that I have just alluded to.

I thank Representative Wilson, who is here present—good morning, and it's great to have you here with us, Heather—for her willingness to introduce in the House the 2025 legislation that we will allude to and she will comment on, since she will introduce it in the House, and that will be an effort to extend that legislation onward out into the future years to maximize the effect.

Now a moment on water technology. We also need to seek technological solutions to our water supply problems. In addition to other Federal water research initiatives that we have going, Sandia National Laboratories has been asked by us to work at developing technologies and managing technology development that helps address New Mexico's water scarcity issues. These efforts include creating some new tools to make available new sources of water. They will provide us with an update on their progress today.

We wish we had more time, more lead time, and that we were operating on the program where they were already 5, 6, 7 years into the program. We would be seeing some bigger results. But things are coming.

As we face this drought, we need to be as frugal with our water as possible. I would encourage all New Mexicans to be sensitive to the fact that we are in one of the worst droughts in 100 years, and the use of our water should be handled sparingly, without any question.

I would now like to welcome and yield to Senator Bingaman for his comments, and then we will start with our first witness.

Senator Bingaman.

**STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR
FROM NEW MEXICO**

Senator BINGAMAN. Thank you very much, Mr. Chairman, for having this hearing, for inviting me to participate, and to all of our excellent witnesses. I know a lot of staff work has gone into preparing the hearing, and I know it's been very good staff work.

As I understand the purpose of the hearing, it is to focus on the effects of this ongoing drought and also to focus on the programs that can help to address some of the problems associated with the ongoing drought.

I'd like to join you in welcoming the witnesses. I hope we can find, out of this testimony, some innovative ideas and solutions to the water supply issues that we face here in New Mexico. Obviously, the drought is what has brought us to this hearing. There are obviously other issues that also are drivers for our concern about water. The growing population in our State, climate change issues, issues that put increased stress on available water resources.

The bottom line is: We need to find ways to balance our use of water with whatever we determine are the sustainable supplies in the region. That's what we're all struggling to do. I know there's always been agreement that management of water is a State issue and a local issue, and not a Federal issue. But I do believe the Federal Government can play a significant role in supplementing what States can do in finding solutions.

I compliment you on your work in the Energy and Water Appropriations Subcommittee and trying to help with the specific issues we have in New Mexico. I think notwithstanding those efforts, you would probably agree that it is a constant struggle giving priority, or seeing that in Washington, where we have a lot of water, that the people in our Nation's capital recognize the priority that needs to be given to water issues out here in the arid West.

The administration's budget requests this year makes the case that this priority needs to be recognized. The budget proposes a 13 percent cut in EPA's Clean & Safe Water programs, an 11 percent cut in the Army Corps of Engineers water budget, and a 21 percent cut in the Department of Agriculture's program for water and wastewater disposal grants. So we have not, in my view at least, given the priority in Washington at the Federal level consistently that we need to, to the water needs that we face here in the arid Southwest.

There are areas where the administration has understood the importance of water, and I support those. We have this project or program of Water for the Poor Initiative. It is to address international water needs, and I think that is certainly a valid program that I would support.

I don't think we have a similar level of commitment out of the administration on some of the more local issues that we face here. We have various water rights settlement issues that I know many in this room are expert on. Our State engineer here in particular I see as one of our upcoming witnesses. That is going to put an enormous burden on us to try to find funding for those, and I'm sure you're well aware of that.

The Eastern New Mexico Rural Water System is another example. The Navajo-Gallup Pipeline Project, another example. There are various needs that are going to require attention that relate to our water supply in New Mexico. I think this is a great opportunity to get the issues out and hopefully find some solutions, and I look forward to learning from each of these witnesses. Thank you again for inviting me.

The CHAIRMAN. Thank you, Senator Bingaman. There is no question that when it comes to water funding in executive budgets—that is, Presidential budgets—both the Corps of Engineers and Bureau of Reclamation and other normal water institutions are always underfunded as the budgets come down and then they leave them in our laps in the Appropriations to try to make up the difference. And we'll have the same problem this year in three areas that you have mentioned, but I have no solution as to how we're going to pay for the settlement of big litigation issues. I'm working as hard as I can to find solutions. But on some of the other, we will find money to make a better case from Washington than the executive budget put forth.

With that, we're going to start with our first witness, Representative Heather Wilson.

Glad to have you. Would you please tell us about—talk to us about whatever you'd like to for a few minutes.

**STATEMENT OF HON. HEATHER WILSON,
U.S. REPRESENTATIVE FROM NEW MEXICO**

Ms. WILSON. Thanks, Mr. Chairman. It's a pleasure to be with you today. And Senator Bingaman, it's also a pleasure to be with you. I think we're blessed in New Mexico to have two senators so well placed to address these kinds of issues, because you're right, there's a lot of water in Washington, and it is sometimes hard to remind people that these issues are important in the West. And I appreciate your leadership, from both of you in the Senate, and certainly, Senator, you on the energy and water appropriations, there's some really important work you have done, and I commend both of you for it.

I wanted to talk a little bit and really focus on the Rio Grande, but also on the Water 2025 legislation that we're going to introduce into the House to try to address the major issues here. We're all focused on the drought this year. It's the worst drought in 100 years. The snowpack was the worst we've had in 50 years, which any skier would tell you, but it's also a big concern for those who

depend on that snowpack to come down the rivers and irrigate their lands, have that water available for the six Pueblos, the city of Albuquerque, the agricultural users, and many smaller cities along the Rio Grande. It's a bad year.

But there is a broader, longer-term problem, and that is that America is growing in the South and the West, and our most precious resource is water. And being able to manage that resource and come up with innovative ways to make that water go further is what we're trying to do in the Water 2025 legislation.

This map behind me here was produced by the Department of the Interior in a very good study they did about where it is most likely in the United States we're going to have major water conflicts by the year 2025. And if you'll notice, water conflict is highly likely on the Middle Rio Grande by 2025. And these red areas are the areas where the Department of the Interior is putting special emphasis to manage potential conflict, so that those conflicts become less likely and we can make the water we have go further.

In the Rio Grande, under the interstate compact signed in 1938, New Mexico gets 393,000 acre-feet of water. We share that with the compact between Colorado, New Mexico, Texas, and Mexico. And under that interstate compact, we've got a limited amount we have to deal with. We've got to make that go—make the expanded uses for that water, as New Mexico grows, possible without widespread displacement of existing users and a change to our quality of life that all of us enjoy.

What we intend to do is to reauthorize—I'll be the sponsor in the House, with Senator Domenici in the Senate, to reauthorize the Department of the Interior's Water 2025 Program, and it's been a very successful program in figuring out ways to make water go further. It's a 50/50 match program where local authorities come up with 50 percent of the funds, and those moneys go further with matching 50 percent Federal funds to avoid water crises and avoid water conflict in the West. It allows those grants and cooperative agreements to go forward in areas of high potential conflict like the Middle Rio Grande.

I always think it's easier to explain an example than to say, "Well you have got this program that is really good and gives grants," and the Middle Rio Grande Conservancy District has done a lot to make the water they use for their agricultural users go a lot further than it used to. And they got a grant for—the total Federal part is \$3.5 million, and they matched it with their own funds, and, of course, they have done a whole lot of other work on their own. But what they did was, they put in gauges on the ditches and they put in automated water gates and they put in weather stations so that they can calculate crop needs so they don't overwater in the fields.

And by putting in those automated gates and those gauges and those weather stations, they have managed to reduce the amount of water that the conservancy district is diverting from the river in the first place, while all the water users still get enough for their crops and for their uses.

Is there a lot more to do? Absolutely. And that's why this 2025 grant program needs to be reauthorized. Middle Rio Grande Conservancy District has reduced diversions from the river by 39 per-

cent since 1994. I think they deserve some credit for that, and I think it's also something to build upon as we look at cooperative programs to make the water that we have go further.

This bill is also going to authorize the Secretary of the Interior to enter into cooperative agreements with research institutions. And I think one of the ways we're going to make water go further is to fund research into conservation of water, to increase the efficiency of the use of water, and to enhance water management. How can we use this precious resource more widely?

I look forward to introducing this legislation in the House when we go back next week, and we will introduce the bill next week, and then moving it through the House of Representatives and continuing to work on problems related to water, so that when we're back here in the year 2025, the Middle Rio Grande isn't a red area, where we avoided water conflict, and where we solved problems by finding innovative, outside-the-box solutions.

Senator, thank you for holding this hearing here today. Senator Bingaman, thank you, as well, for your openness to work solutions and focus on problems that are important here in central New Mexico.

Thank you, Mr. Chairman.

[The prepared statement of Representative Wilson follows:]

PREPARED STATEMENT OF HON. HEATHER WILSON, U.S. REPRESENTATIVE
FROM NEW MEXICO

Chairman Domenici and Ranking Member Bingaman, thank you for the opportunity to address the Senate Energy and Natural Resources Committee on the impact the drought is having on managing New Mexico's most precious natural resource—water.

According to the United States Department of Agriculture, New Mexico is facing one of the worst droughts since the early 1900s. Historic snow pack data indicates the 2005-2006 snow season is the worst in more than 50 years and, for much of the state, the period from November 2005 to March 2006 is the driest in recorded history.

Mr. Chairman, the First Congressional District of New Mexico is bisected by the Rio Grande. The Middle Rio Grande's unique historical, biological, and hydrological factors make managing the river's flows to meet existing demands during periods of drought very difficult.

Chaco Canyon in northwestern New Mexico was the home to many indigenous southwestern peoples from A.D. 850 to 1250. Unfortunately, the Chacoans ingenuity in storing and channeling water was not enough to save them from a 50-year drought that began in 1130. The Chacoan pueblo people left Chaco Canyon in stages and established a string of pueblos along the Rio Grande and a few other desert rivers.

Mr. Chairman, U.S. Army Corps of Engineers (Army Corps), U.S. Bureau of Reclamation (BOR), and Middle Rio Grande Conservancy District (MRGCD) flood control and reclamation projects along the Rio Grande and its tributaries, store water during wet years for use during dry years. They help ensure that New Mexico's current population will not have to relocate during extended periods of drought—like the Chacoans were forced to do more than eight centuries ago.

However, the demands on the Middle Rio Grande are immense and growing. The flows of the Middle Rio Grande serve the biggest city in New Mexico, Albuquerque, many smaller cities, six Indian pueblos, and a network of agriculture users. Many of these farmers irrigate the same land as their Spanish ancestors did over 4 centuries ago. In addition there is the endangered silvery minnow, which, under a 2003 U.S. Fish and Wildlife Service Biological Opinion, requires 180 miles of continuous minimum river flow in the Middle Rio Grande.

New Mexico has an average allotment of 393,000 acre-feet of Rio Grande water under the 1938 interstate compact that apportions the Rio Grande between Colorado, New Mexico, Texas, and Mexico. These demands have stretched this allotment to the limit. Further complicating the picture is the fact that Article VII of the Rio

Grande Compact severely restricts New Mexico's ability to store native water up stream at Heron, Abiquiu, El Vado, or Cochiti Reservoir.

These factors, all putting pressure on the river and the people who live here, are why the Department of the Interior believes the potential for water conflict along the Middle Rio Grande by 2025 is highly likely.

Mr. Chairman, the legislation that you and I are sponsoring to reauthorize the Department of the Interior's highly successful Water 2025 program will allow the Bureau of Reclamation to continue to help stretch the limited flows of the Rio Grande and, as a result, help prevent a water conflict along the Middle Rio Grande well into the future.

To date, BOR has awarded a total of 68 Water 2025 grants. In FY 2004, 19 grants were awarded to irrigation and water districts, in FY 2005, 43 grants were awarded to irrigation and water districts and six grants were awarded to Western States in FY 2006. In total, the state of New Mexico has received over \$5 million in Water 2025 funding.

In FY 2004, 2005, and 2006, the MRGCD received Water 2025 funding in order to make water efficiency improvements. In total, MRGCD has received \$2.5 million dollars in Water 2025 funding and is set to receive an additional \$1 million later this year. Due in part to this funding, MRGCD has installed 56 new and upgraded 14 old gages to measure water flows in its irrigation water delivery system. Additionally, forty three automated water control gates have been installed, and 18 weather stations have been built to calculate consumptive water needs of both crops and riparian vegetation.

These improvements have resulted in the MRGCD reducing its diversions from the Rio Grande, providing a more reliable service to water users, and aiding in meeting the flow requirements required by the 2003 Biological Opinion for the Rio Grande Silvery Minnow. Since 1994 MRGCD has reduced its diversions of water from the Rio Grande by 39 percent. It is estimated by BOR that in the west the Water 2025 program has yielded 285,342 acre feet in additional water per year.

Mr. Chairman, I look forward to working with you on moving this important legislation through Congress so that the Water 2025 Program can continue to provide assistance to Western states and water districts to help stretch limited river flows during times of drought and hopefully help prevent water conflicts in Western states well into the future.

Again, thank you Chairman Domenici and Ranking Member Bingaman for the opportunity to address the Senate Energy and Natural Resources Committee today on this critically important issue.

The CHAIRMAN. Thank you very much, Representative. Now, we will have the first panel. You're excused.

Ms. WILSON. Thank you.

The CHAIRMAN. The first panel is made up of Mr. Bruce Knight, chief of the Natural Resource Conservation Service—If you will please take your seat here at the table—Mr. Larry Perkins, farm superintendent, Agricultural Service Center, Tucumcari; Mr. Randy White, certified public accountant; and the Honorable Ray Nunley, mayor of the village of Ruidoso.

All right. We're going to take you in the order that we announced your seating.

Bruce Knight, welcome. Please tell us a bit about yourself, and then your statement will be made a part of the record, and you deliver whatever you—however you'd like, making it as brief as possible.

STATEMENT OF BRUCE I. KNIGHT, CHIEF, NATURAL RESOURCES CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE

Mr. KNIGHT. Thank you, Chairman Domenici, and Ranking Member Bingaman. It's a pleasure to be with you today. I am first and foremost a farmer and a rancher myself, from a drought-plagued portion of South Dakota, but I'm still blessed with more

moisture than I think many of my compatriots on the panel will be able to talk about.

I have been chief of the Natural Resources Conservation Service for the last 4 years. The Natural Resources Conservation Service provides private lands conservation and conservation solutions to America's farmers and ranchers around the country and it's a part of the Department of Agriculture.

Before I get into my formal testimony, I would like to take the liberty of introducing our new state conservationist, the head of our office here in New Mexico, and that is Dennis Alexander. And Dennis has all of 2 weeks in the job, but has experience in the West, comes to you from Colorado, and will stand to assist you, along with all of our personnel, on drought and all the full range of conservation issues.

I will make my comments as brief as possible. We have extensive detailed comments in the formal written record. But I will report today on the current and future snowpack conditions, the water supply forecasts, soil moisture content, reservoir storage, and the NRCS activities to improve drought preparedness and monitoring for farmers and communities across the West, as well as New Mexico.

In addition to delivering voluntary natural resource conservation programs, as we've mentioned, the NRCS monitors and forecasts current conditions, such as the amount of snowpack, the water supply availability and the moisture level available to plants in the snow profile. We do this through the following services and programs.

First, the Snow Survey and Water Supply Forecasting Program provides agricultural users in 11 Western States with water supply forecasts to enable them to plan for efficient water management. NRCS maintains a network of 1,600 high-elevation snow measurement sites, including 715 automated sites across the United States. These SNOTEL stations report daily and hourly snow precipitation and temperature data.

Second, the data collected from these SNOTEL sites allows NRCS to forecast the spring and summer runoff or water availability. Over half of New Mexico's annual water supplies come from snow melt. Therefore, when engaging water supplies for the future, it is critical to measure snow accumulations over the winter. On April 1 of 2006, nearly all New Mexico river basins reported reduced snowpacks, less than 50 percent of average. Due to these conditions, anticipated streamflows in most basins for the summer are expected to produce 50 percent of normal runoff. In addition, current reservoir storage is generally fair to poor, depending on location within the State. With the expected reduction in spring runoff from snow melt, the State will have to rely on water stored in the current reservoir system.

And last, NRCS operates three soil climatic analysis network sites, SCAN, in New Mexico to monitor real-time soil moisture and temperatures, and analysis of soil moisture values through this network has documented the drying trend not only in New Mexico, but in Arizona and west Texas, as well.

Mr. Chairman, with the low-water-availability information gathered through our data networks, NRCS has been proactive in help-

ing prepare New Mexico farmers and ranchers to expect a dry summer in 2006. The Natural Resources Conservation Service is working closely with landowners on practices and projects that will increase irrigation efficiency and achieve net reductions in water demand. Through the Ground and Surface Water Conservation component of the Environmental Quality Incentives Program, NRCS has provided nationwide more than \$150 million in financial and technical assistance to help landowners in realizing water conservation savings through our on-the-ground efforts.

Activities under the Ground and Surface Water Conservation Program include improving irrigation systems, enhancing irrigation efficiencies, converting to less intensive agricultural commodities, switching to dryland farming, improving the storage of water through such measures as water banking and groundwater recharge, and mitigating the impacts of drought.

Projects must result in net savings of groundwater or surface water resources to the agricultural operation. In fiscal year 2005, through both the EQIP program and the Ground and Surface Water Conservation Program, farmers and ranchers nationally were able to conserve nearly 600,000 acre-feet of water. And in New Mexico, from these two programs, that total was over 15,000 acre-feet. To put that in perspective, that approximates the capacity of the Castillo Reservoir in and of itself.

While funding to support water conservation practices is important, NRCS recognizes that dollars aren't the only solution. Educating producers about water consumption and on-farm economic benefits and improved efficiency is also critical. For that reason, NRCS is currently developing an irrigation water energy estimator for our agency's web site. This is part of our energy initiative, and I mention that today because, as we all know, the easiest way to save energy on an irrigating operation is to reduce the amount of water that we're actually having to move and pump. And so this, too, will help farmers explore future management scenarios, including changes in irrigation equipment and practices. What I like most about this product is that it's available 24 hours a day, 7 days a week. Nobody has to go to the office or stand in line to participate in it. We believe that this additional knowledge will assist producers across the country, as well as New Mexico, in making better farm management decisions.

In addition to making conservation programs available to farmers and ranchers and monitoring and forecasting water supplies, the NRCS is implementing improvements in resource data monitoring and assessment capabilities by further automating the change from manual to electronic SNOTEL signs and expanding the SCAN soil moisture measurement tool to provide additional sites.

In conclusion, Mr. Chairman, the Natural Resources Conservation Service will continue to provide high-quality, timely data, drought monitoring, and water supply decision support information so that users and managers of water resources in the West can make scientifically based decisions. We'll continue to collect snowpack and soil moisture data through the SNOTEL and SCAN information systems, and provide a forecast of spring and summer streamflow that are used by thousands of natural resource man-

agers and farmers and ranchers throughout the West. NRCS staff will continue to support the weekly U.S. drought monitor and NRCS products used by each State to determine drought mitigation strategies as well as actions.

Thank you for the opportunity to give you a thumbnail sketch of NRCS on this issue. This concludes my statement, and I would be pleased to answer any questions either the Chairman or the Ranking Member may have.

[The prepared statement of Mr. Knight follows:]

PREPARED STATEMENT OF BRUCE I. KNIGHT, CHIEF, NATURAL RESOURCES
CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to appear before the Committee to discuss the current status of drought in New Mexico and neighboring States. Drought as a natural disaster is not easily recognized in its early stages. However, the longer it lasts the more detrimental its effects to natural resources and human communities. In my remarks today, I will report on the state of drought, current and future snowpack conditions, the water supply forecast, soil moisture content, reservoir storage, and NRCS activities to improve drought preparedness and monitoring for farmers and communities across the West.

The Natural Resources Conservation Service (NRCS) is responsible for the Snow Survey and Water Supply Forecasting Program, which provides agricultural water users and other water management groups in the 11 Western States and Alaska with water supply forecasts to enable them to plan for efficient water management. The program also provides the public and the scientific community with data that can be used to accurately determine the extent of the snow accumulations and ultimately the surface water resource. Up to 80 percent of the stream flow in the Western United States is derived from melting snow pack, so accurate measurement is critical to those that depend upon water resources.

In order to provide these services, the NRCS maintains a network of high elevation snow measurements throughout the Western U.S. Snow surveys across the West take place once a month from January through June and involve travel to specific remote locations (snow courses) and manually measuring the snow. In the past 30 years, the NRCS has automated 715 of the 1,600 sites in the West. Measurements from these automated sites, called SNOTEL (SNOW TELemetry) stations now report daily and hourly snow, precipitation, and temperature data. NRCS also operates three Soil Climate Analysis Network (SCAN) sites in New Mexico that monitor real-time soil moisture and temperatures.

CURRENT STATE OF DROUGHT IN NEW MEXICO

Most parts of New Mexico have experienced some category of drought since 1999 when the United States Department of Agriculture (USDA) partnered with other Federal agencies to initiate a weekly drought assessment called the U.S. Drought Monitor. The current drought has recently intensified as a result of an exceptionally dry fall and winter.

The U.S. Drought Monitor dated March 28, 2006, shows New Mexico is experiencing "severe" drought conditions in 70 percent of the State and "extreme" drought in 23 percent of the State (Fig. 1*). The most extreme conditions are reported in the south stem part of the State. Recent storms have brought limited relief; however, drought conditions are expected to persist through June 2106, well beyond the snowmelt and runoff season (Fig. 2).

CURRENT AND HISTORIC SNOWPACK CONDITIONS—NEW MEXICO

Over half of New Mexico's annual water supplies come from streams that are fed by snowmelt coming from the mountains. Therefore when gauging water supplies, it is critical to measure snow. The NRCS New Mexico Snow Survey network began in 1937 in the mountains above Taos, and expanded to a network of 28 manual and 20 automated sites today. Across the entire State, many sites that were snow-free on March 1, 2006, remain exceptionally low in spite of recent storms.

On April 1, 2006, nearly all New Mexico basins reported snowpacks of less than 50 percent of average with several basins reporting less than 25 percent of average

*All figures have been retained in committee files.

(Fig. 3). Almost half of the New Mexico's long-term measurement sites are at record lows for this time of year and a full one third of the sites have no measurable snowpack.

Statewide, the snowpack is the 5th lowest in the last 55 years at 29 percent of normal (Fig. 4). Since 1999, the average April 1 snowpack has been 64 percent of normal. If it were not for the brief respite in 2005, this 8-year stretch would be the longest drought in modern records.

The latest snow survey shows that what are typically the wettest parts of the State have simply fallen too far behind to contribute meaningfully to water supplies this year. This late in the season, there are not many opportunities for recovery, although a significant spring event could still influence the course of the season.

STREAMFLOW OUTLOOK

Due to exceptionally poor snowpack conditions, anticipated streamflows are expected to be very low. The highest flows are projected to reach only two-thirds of normal for the rivers that flow into New Mexico from Colorado. Within New Mexico, no stream is forecasted to produce more than 50 percent of normal runoff.

For the period April-July, the inflow of the Rio Grande into Elephant Butte reservoir is expected to be 11 percent of normal. The flow of the Pecos river at Pecos has been forecasted by the NRCS since 1947 and this month's forecast, 21 percent of normal, is the all-time lowest ever issued.

In the northwest part of the State, many of the streambeds are already dry and it is likely that no more than 2-3 percent of normal runoff will be experienced.

SOIL MOISTURE CONTENT

An analysis of soil moisture values through the NRCS Soil Climate Analysis Network (SCAN) has documented the drying trend in Arizona, New Mexico and west Texas. In October 2005, measurements taken at the 8-inch depth showed soil moisture values that approached vegetation wilting point. By January 2006, the 20-inch deep sensors reported wilting point conditions. This shows the rapid drying of the soil profile.

The Joint Agricultural Weather Facility (a cooperative effort of National Oceanic and Atmospheric Administration and the USDA, including NRCS) reports on April 4, 2006, that topsoil moisture in New Mexico is 55 percent very short, 36 percent short and only 9 percent adequate.

RESERVOIR STORAGE

Current reservoir storage is generally fair to poor depending on location within the State (Fig. 5, Courtesy CLIMAS, University of Arizona). The Navajo Reservoir in northwest New Mexico benefited from above-average runoff last year and is currently at 89 percent of capacity while Elephant Butte reports 22 percent of capacity. With the expected lack of spring runoff, the State will rely on available stored water. For example, using the latest available projections, Elephant Butte will fall from 22 percent of capacity today to 3 percent by Labor Day.

STATE PREPAREDNESS ACTIVITIES

The NRCS is working closely with landowners on practices and projects aimed to increase irrigation efficiency, and achieve net reductions in water use. Through the Ground and Surface Water Conservation (GSWC) component of the Environmental Quality Incentives Program, NRCS has provided more than \$150 million in financial and technical assistance through GSWC.

Activities under the GSWC program include improving irrigation systems, enhancing irrigation efficiencies, converting to the production of less water intensive agricultural commodities, converting to dryland farming, improving the storage of water through such measures as water banking and groundwater recharge, and mitigating the effects of drought. Projects must result in a net savings of ground-water or surface water resources in the agricultural operation of the producer.

Since GSWC began in 2002, NRCS has entered into over 5,000 contracts, enrolled more than 1.5 million acres into the program to help producers conserve ground and surface water resources. An additional \$51 million in GSWC funding is currently available to producers nationwide.

While funding to support water conservation practices is important, NRCS recognizes that dollars aren't the only solution. Education of producers about water consumption, and the on-farm economic benefits of improved efficiency is a critical tool. For that reason, NRCS is currently developing an irrigation water energy estimator on the NRCS website. The purpose of this tool will be to provide farmers the ability

to explore future management scenarios, including changes in irrigation equipment and practices. From the options that the producer provides, the estimator will provide potential energy savings estimates that would result from the change in practices. We believe that this additional knowledge will assist producers in making better farm management decisions for the future.

PALEOCLIMATE DROUGHT RECORD

How unusual is the current drought in a historical context? It does not appear to be as severe as the 1950s drought, which is generally believed to be New Mexico's worst of the 20th century (Fig. 6). However, looking back further in history, using records from tree rings, even the 1950s drought seems typical over the past 300 years. Viewing back more than 2,000 years, history presents many cycles of droughts that are almost incomprehensible by modern standards.

It is impossible to predict whether the pattern of wet conditions over the last 50 years will continue or if the region is due for a return to normal. What has changed however is the significant population growth of the West during this period; this growth has put additional pressures on scarce water resources and made the need for real-time data even more critical.

CONCLUSION

In conclusion Mr. Chairman, the Natural Resources Conservation Service will continue to provide high quality, timely data, drought monitoring and water supply decision support information so that users and managers of water resources in the West can make scientifically based decisions. We will accomplish this by continuing to collect snowpack and soil moisture data through the SNOTEL and SCAN information systems and providing forecasts of spring and summer streamflow that are used by thousands of natural resource managers in the West. NRCS staffs will continue to support the weekly U.S. Drought Monitor and NRCS products used by each state to determine drought mitigation strategies and actions. The National Water and Climate Center homepage (www.wcc.nrcs.usda.gov) is the operational link to this information and is available to citizens nationwide.

In addition to our ongoing monitoring and forecasting of current conditions, the NRCS is implementing improvements in resource data monitoring and assessment capabilities by:

- Further automating of manual snow courses to SNOTEL sites where real-time information is needed to provide water supply forecasts.
- Expansion of SCAN to provide governments, water managers, agricultural producers, businesses and researchers improved information about soil moisture conditions and potential droughts.
- Improving models and computational capacity to provide more frequent and accurate water supply forecasts and assessments of soil moisture.

Thank you for opportunity to describe the work of NRCS on this issue. This concludes my statement. I will be glad to answer any questions that Members of the Committee might have.

The CHAIRMAN. We'll have some questions at the end. Is that satisfactory?

Senator BINGAMAN. Sure.

The CHAIRMAN. We'll proceed with the witnesses and then get to them.

Our next witness is Larry Perkins, farm superintendent, Agricultural Service Center, Tucumcari. Good to have you with us, Larry. It's nice to have you.

STATEMENT OF LARRY F. PERKINS, FARM SUPERINTENDENT, AGRICULTURAL SCIENCE CENTER, NEW MEXICO STATE UNIVERSITY

Mr. PERKINS. Thank you, Mr. Chairman, and Senator Bingaman. I appreciate the opportunity to be here. My request was to basically give you a history of some of the things that actually happen to a rancher and a farmer, and that's pretty much what I am. I am the farm superintendent at the Agricultural Science Center at

Tucumcari, and that took place in 2004, so I have not been there a long time, but I have been 2 years there, and that job was taken solely because of the drought and the situation it put me in.

I'd like to go ahead and give you my statement now. My name is Larry Perkins, and I'm a fourth-generation farmer and rancher from eastern New Mexico, and my ranch and farm is near Tucumcari. I'm also a farm superintendent at the ag science center there at Tucumcari.

My great-grandfather started our farm and ranch in 1912, which is the year New Mexico became a State. In 1983, after getting out of the service, I took over farming, the management and operation of the farm, from my grandfather, and now with the help of my wife and three kids, we're trying to hold on to what was once our way of life. And I make that statement in the past tense, because this drought has drastically changed the way we live and work. Our work hours have increased, our work load has increased, while our income has decreased. And it's decreased due to the herd downsizing, due to limited crop production.

It needs to be understood that it takes a lot more work to protect the farm and the ranch from a severe drought like we're in than it does to operate during a high water production year. A lot of people don't think about that and they think maybe you don't have anything to do, so you sit back. To protect your land from no water is a tremendous thing, and for farmers and ranchers, that's what we live for.

From 1983 to 1986, I ran our farm and our cow/calf operation pretty much the way my grandfather did and my great-grandfather did for the past 40 years. And then when I married, in 1986, she and I did the farm and ranching together. In the 1990's, we combined our farming and ranching operations, which allowed us to triple our herd size over the next 8 years. It was very successful, and we converted much of our crop land into irrigated permanent pastures. And we grew all the forage that the herd required on the remaining crop land, so it pretty much was a self-sufficient operation.

In 2000 and 2001, which many of us know, the drought had come in, but we did have some irrigation water. We had some snowpack that was mentioned before, and the irrigation water was there. But in 2002, that water wasn't there. My irrigation district is the Arch Hurley Irrigation District. We receive our water from the Conchas Reservoir. We received three inches per acre that year. A normal allocation is always at least two feet per acre, and the total amount we can get is three feet. So you can see three inches is not much.

So the drought really became reality to us in 2002. For the first time in my life, I leased pasture and I bought hay, and I have never done that. In 2003, we had cut our herd by 50 percent, and my wife went back to work teaching after 14 years of being home with myself and raising our family. By the end of 2003, we had cut an additional 15 percent more of our herd, and our land was rough. It was parched and bare.

We had received very little rain in those 3 years, and three inches of irrigation water. In 2003, 2004, we got no irrigation. In 2004, I started looking for work and that's when I was lucky enough to find the job and get the opportunity to work for the Agri-

cultural Science Center, New Mexico State University. And so I took that job as their farm and ranch superintendent.

Last year we got a little reprieve, so we bought back some cow/calf pairs, because we still farm our same ranch, farming ranch, and so that is our living. But right now, looking at 2006, this year we're going to receive six inches of water, which is not going to do very much for us. So it looks like those cattle that I bought will be culled back and go back out on the marketplace.

One of the things you need to understand is, the drought, whether we want to think it, it's far from over. And it's going to take all of us together and it's going to take a long time to recover, even after we get the rain back. One of the misconceptions that a lot of people have about the drought is that with one rain, it's going to be—everything will be back to normal, which is very far from the—you know, one good rain would help us, but the long-term effects of this drought will be felt for many years to come, and I don't think—it will not and cannot be solved overnight.

As I stated before, with the help of my wife and my three kids, we have continued to run our farm and ranch, but now in order to meet the financial needs that go along with the farm and a ranch, we're holding down two full-time jobs, we do our farming and ranching before work and after work at night, and on the weekends. This requires a lot of work from each member of my family, especially including my 6-year-old son and my two daughters, 13 and 11. They work and they do—they feed the cattle, feed the yearlings, feed the livestock before they get on the bus, and they get on the bus at 20 minutes until 7. So it's a burden on them also.

But our way of life is important to my family, and we're willing to make those kind of sacrifices. I don't think there's one farmer or rancher in the whole State or in the whole drought area that could not give a similar account of their unique situation. You know, some of them could be a little better than mine, as Mr. Knight pointed out, but some of them could be a lot worse. And you know, I have been fortunate that my wife and I both found work.

One of the most devastating effects of this drought, I think, is how long it's stayed and how long it's held on, and it's held our income down to record lows. The other side of that fact is that the debt and bills that the farmers and ranchers have still have to be paid. With income being lower, that's really difficult. I know many good, hardworking men that have not been able to hang on. They have lost their farms and many of these farms are family farms that have been there for many past years.

Some people think that the drought only affects the farming and ranching sector of the State. I think they need to reconsider that thought. For every farmer and rancher, such as myself, that takes a job in town, that's one less job that could be given to a nonfarmer or a nonrancher. For every foot of water table that drops, it becomes more costly to pump their drinking water or to even water their lawns here in town. I know personally my wells out on the ranch have dropped over 20 feet in the last 5 years. I spoke to one of my neighbors the night before last, at a meeting. One of his wells is completely dry now, so he's having to—as Senator Domenici said, he's having to start hauling water to those pastures. For

the price of fuel, you all can imagine what that's going to be. You know, for each week or each month that goes by without rain and our land rangeland, our parks, our forests, they get dryer and dryer, and they become much more vulnerable to wildfires, which we've all seen the result of here recently in the Texas fires, and a lot of eastern New Mexico has had fires also. This costs every one of us in one way or the other.

It is a fact that the farming and ranching individuals of our State feel the direct hit from the drought, but the drought does affect everyone in the State. There are a lot of underlying aspects of this drought that many people don't seem to understand, and even though they think they have nothing to do with agricultural industries, the declining water tables and aquifers need to be a major concern, I think, to the State and to everyone in the State. People need to understand that their food only comes to the grocery store from the farm, and they also need to understand that their water doesn't come from a faucet; it comes from the wells that these water tables are depleting. The danger of the wildfire is not just a forest or rangeland problem, but it's a problem throughout the State, including in the cities and the towns.

I think we could go on and on, but the point is that the drought does affect everyone, not only in our State of New Mexico, but in all of the States that are affected by this. I don't think there is a man-made cure for the drought, but there are committees such as this one that we're speaking to that are willing to take the time and to try to do something to help. And I know that there are a lot of folks like myself, others on the committee and others that are here that are willing to do whatever it takes to help all of us make it through this drought.

I know it will rain someday again and things will be better. It will be better because we'll have learned from the past. We will have survived this drought and we will be better conservationists and we will not take our valuable water resources for granted. I also know that if we don't try to help each other, that there's going to be a lot less of us here when it is over.

I thank you for this opportunity to testify before the senators and the committee and to tell my personal story. Thank you, sir.

The CHAIRMAN. Thank you very much. And I guarantee you that everybody appreciates hearing your story. It gives us a good example, a good background of what's really happening. Thank you for it.

Now, we have a clock here that isn't working very well in terms of you all seeing it. We're not going to hold you exactly to it, but you know, we've got a timer here, and we're going to at least set it up where you can see it.

Mr. White, it will be visible to you someplace here. We just have to make it less obtrusive, but visible. We'll put it over there. Now we're going to hear from you. Certified public accountant, Randy White. Please proceed.

STATEMENT OF R.B. "RANDY" WHITE, C.P.A., BLACK CATTLE RANCH, LLC, ALBUQUERQUE, NM

Mr. WHITE. Thank you, Mr. Chairman and Mr. Ranking Member. I'm here today more to tell my personal story than represent my

ranching clients, per se, because my story is basically the same as the whole ranching community and Mr. Perkins and everybody else.

Drought is a horrible thing to go through, both a financial and an emotional stress. When I had breakfast this morning, I opened up the paper. I think I can keep my comments strictly to what the paper said this morning in the article on the drought; it said, "New Mexico's rangeland and pasture have withered because of dry weather."

You can go to my place at Black Cattle Ranch just west of Albuquerque, and there's nothing left, basically. I mean, we're feeding the cows every other day to try to get through until hopefully another rain. "The agency," meaning the Weather Service, "said 13 percent of the rangeland and pasture is good to excellent, down from 60 percent last May."

Well, 13 percent good—fair and poor are the other definitions—is not very productive.

I'd like to read from my prepared statement a little bit to make some points, and then give you a couple of financial things that have happened to me because of the drought since 2001.

I operate Black Cattle Ranch on the West Mesa of Albuquerque. I've done that for almost 20 years. I'm secretary-treasurer of the New Mexico Cattle Growers Association. I run the ranch with my family, Kate, who's a sophomore at New Mexico State, majoring in agricultural business, and Justin, who's a seventh-grader at Jefferson and does all of our fencing.

Our family operation includes a purebred Hereford operation and a commercial herd. We operate strictly on leased private lands and city of Albuquerque open space on the West Mesa. Due to the drought I'm also leasing and have sent half of my cows to Santa Rosa, at additional cost, to try to get through this period of time. Not only do I have to face the impacts of drought in my own operation, but you have to analyze the financial burdens long-term drought is placing on many of my friends and my clients. It's difficult to quantify the total financial impacts of drought on the cow/calf industry, but they include the additional supplemental feed, which is what we're struggling with now. I have had two semis show up in the last 3 months to try to keep the cattle in shape, enough shape to raise their babies and breed back, so we can have some revenue in 2007. I have reduced my stocking rates from roughly 200 to 60 since 2001, when the drought started to set in.

My break-even with my operation doesn't matter whether you have 2,000 or 200 cows. The numbers pretty much are the same on a per-cow basis. We basically brought it down to 60. As the cow numbers go down, the costs don't always change. Not only does the feed cost go up, but a lot of your fixed costs: Your pasture lease, everything. Fuel has gone up. We went—in this state, the average cost per cow is about \$357. That is what it takes to operate a cow in a year. With the added fuel and with the added feed costs to maintain that cow for a year, we're up to \$450 to \$500 a cow, which basically means everybody is underwater, ready, however you want to look at it.

The average profit over a long period of time on cows in this State is around \$50 a cow. Well, \$50 buys enough feed to feed a

cow for 1 month. So, in essence, if you feed a cow for a month, you're not going to make any money. If you feed her for 2 months, you have already lost money. And that \$50 you lost on the second month you fed her is next year's profit, so you're already digging a hole.

A lot of us, including me, have only been able to survive and keep our base and keep our genetics that we've all tried to improve to provide the consumer a good product, through artificial insemination and good bull power. The only way we can do that is to keep a base genetic herd even though it's below our break-even.

The Federal Livestock Disaster Assistance programs have kept many of us in business. 2001, 2002, 2003, basically it's enabled us to not make money but to survive and keep that base genetic herd together so that we can go forward hopefully to better times and more range. The other programs, such as the EQIP program Mr. Knight mentioned, certainly help in the infrastructure of the facility to operate more efficiently with these additional costs.

That's something that all of us in the Southwest realize. I mean, my ranging clients in Texas and Oklahoma haven't been much different than we are here. It just seems that the timing changes—sometimes we'll be especially bad here and they'll be good there—but it's the same costs.

One other comment I want to make is during the drought, feeding cattle is not necessarily a profitable alternative, but if it's a short-term supplemental sort of thing, you can get there. The government programs have enabled us to stretch out our grass resource and get months down the line in hopes that some rain will come. And if that does, in fact, come, then that's probably a brilliant decision. If it never comes, then it's not, because liquidating cows in a drought isn't very profitable either, because we're all in the same boat, within 500 miles. Nobody wants the cows anyway.

There used to be a joke years ago, in 2002, when the drought really started to get bad, that don't ever stop and park your truck and trailer unattended, because somebody will put cattle in it.

[Laughter.]

Mr. WHITE. That's about how valuable they were at the time.

And so the Government programs have kept health insurance paid for families. I mean, they may have paid us to help with the supplemental feed to get through the drought times, but in essence, it also pays health insurance for the family, and living expenses, also.

I'm at a decision tree, like many of us are now, where I'm already down to below the base level, and we don't see any possible rain maybe for 2 minutes. I mean, 2 months. Sorry. I looked at the light.

[Laughter.]

Mr. WHITE. So basically, it's hard times for everybody, and the only way we're going to survive that is with some government help and aid. I thank you for the opportunity.

[The prepared statement of Mr. White follows:]

PREPARED STATEMENT OF R.B. (RANDY) WHITE, BLACK CATTLE RANCH, LLC,
ALBUQUERQUE, NEW MEXICO

Mr. Chairman, Mr. Ranking Member and members of the Committee, on behalf of the agricultural industry and all New Mexicans, let me thank you for holding a

field hearing in New Mexico on this issue so vital to our livelihoods and futures, and for the opportunity to testify before you. We are especially proud in New Mexico to have both the Chairman and the Ranking Member from our state.

My name is Randy White. I reside in Albuquerque where I run a cattle operation and an accounting firm. A significant portion of my client base is in the ranching industry. I have two children, Kate, a sophomore at New Mexico State University (NMSU) majoring in agricultural business, and Justin, a seventh grader who spends his weekends at the ranch feeding. Our family operation includes a purebred Hereford herd as well as a commercial herd we have maintained on Albuquerque's West Mesa using both leased private lands and Albuquerque Open Space property. Due to the drought we are also leasing pasture near Santa Rosa, New Mexico, just to have enough feed for the cattle.

I am here today representing New Mexico's agricultural industry, including the New Mexico Cattle Growers' Association (NMCGA), where I have been the Secretary/Treasurer for the past 10 years. In addition, my accounting practice serves numerous ranching operations in New Mexico and across the Southwest.

Not only do I have to face the impacts of the drought on my own operation, but I have to analyze the financial burden this long-term drought is placing on my accounting clients, which I believe represent a fair cross-section of the ranching industry.

It is difficult to quantify the total financial impacts of the drought on the cow/calf industry. But, they include the need for additional supplemental feed, which leads to additional labor and transportation costs. There are costs also associated with providing water for livestock. With the drought there is little to no surface water available, which leads to either pumping more water or to the purchase and hauling of water. Finally, there becomes the need to reduce stocking rates, which in the cow business means that we are literally selling the factory. When we must reduce herd size due to drought, we are selling animals that are the result of generations of genetic selection for traits that are compatible with our environment and that satisfy the consumer. They cannot be replaced by simply buying other cattle when better times arrive.

The need to lease the pasture in Santa Rosa is costing my operation \$7600 per year, which can never be recouped. A ton of hay today costs \$160. This is an increase of \$40 over last year. A ton will feed 100 cows for 1 day.

No small part of this issue are the huge fluctuations and ever increasing fluid energy costs we have experienced over the past few years. Not only are we paying higher prices for the fuel we use on the ranch, but the producers of the commodities we need are paying higher prices which leads to higher commodity costs for us.

My fuel bill has almost doubled in the last two years.

Western states are bearing another burden of our nation's energy crisis that is directly tied to the drought. This is oil and gas exploration and production. While I strongly support the need for a secure domestic energy supply, it must be done in a responsible manner. Ranchers and landowners in the northwestern and southeastern part of New Mexico are paying the price for our nation's drive to a sustainable energy supply. The surface estate, the land, must be cared for while energy is being produced. There are responsible energy producers, but there are those who are not. The drill pads and multiple roads and pipelines without adequate reclamation are leading to scarring erosion that may not heal for generations. That erosion is leading to water quality degradation that we can ill afford, especially during a drought when water is so precious.

We in the ranching industry are most appreciative of the programs the federal government has provided in the face of this drought. Some ranchers have avoided liquidation because of this assistance. The Livestock Assistance Program (LAP), crop insurance for grazing lands, and the ability to graze on Conservation Reserve Program (CRP) lands have all been extremely helpful in keeping producers in business. As we look forward to the 2007 Farm Bill, we hope and pray that Congress continues to recognize the great need for these programs as well as the value of a secure domestic food supply. Conservation programs are nice, but instead of devoting tens of millions of dollars to "conservation" programs that divide private property rights, we need programs that support production. This is most obvious when we are suffering an extended drought, which we do regularly in the arid Southwest.

Another constant worry cattlemen face today is the unknown amount of forage grasses that permanently die off during a long-term drought. I don't know any livestock producer who doesn't provide the maximum amount of stewardship for the land possible. Unfortunately in a drought time and money are devoted almost solely to keeping the animals, both livestock and wildlife, fed.

Living near a major metropolitan area, we have had the "luxury" of resources other producers might not have. We are involved with the City of Albuquerque in

an experiment utilizing treated waste as sludge spread on the ground, which provides nitrogen to enrich the soil and hopefully save grasses from the devastating impacts of the drought.

The Environmental Quality Incentives Program (EQIP) has also been helpful to me and other agricultural producers in providing funding to for fencing and water development to better manage our livestock and utilize the land available.

An important fact to remember is that as ranchers provide for their livestock they are doing an additional service—they are providing the life sustaining feed and water for the “public’s” wildlife. The abundant wildlife populations that our state and nation enjoy are largely the result of the agricultural industry.

Although my family does not ranch on federal lands, many of my clients do and as an officer in the New Mexico Cattle Growers’ it is an issue I am much more familiar with than I would like to be. With some 60 percent of the land base in New Mexico owned by government of some kind, the health of the federal and state lands segment of the ranching industry is critical to the infra-structure of the industry as a whole in addition to the tri-ethnic culture our state was founded on.

Both the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) have struggled with balancing the need to keep livestock producers on the ground now and into the future with the condition of the range. This drought has been particularly harsh on USFS allotment owners in the Southwest. The agency is inundated with litigation from so-called environmental groups attempting to drive livestock from the land. During a drought, dotting every “i” and crossing every “t” in federal regulation is often not possible or even practical. However, in an apparent effort to avoid even more litigation, federal agencies would rather remove livestock than find workable solutions. In many New Mexico counties, livestock is the last viable industry left. Eco-tourism may be a popular term, but it is not and will not pay the bills for rural communities and families. Additionally, the need for a safe, domestic food supply must be considered.

Another issue that has not directly affected me, at least yet, is fire. Although New Mexico has not faced the livestock losses due to fire that fellow ranchers in Texas and Oklahoma have suffered, we have lost hundreds of thousands of acres to fire. This is leaving ranchers without any pasture at all. If they are to keep any cattle, they are going to have to purchase feed. It doesn’t take very long for that to be financially impossible.

In summary, the drought has been costly for ranchers in New Mexico and throughout the West especially in terms of providing supplemental feed and hay so that we can retain our livestock. It appears that, although we don’t like it, we must look to the government for continued programs like LAP and pasture insurance that will provide ready cash we can use to purchase feedstuffs.

Low interest loans have long been at the top of the list of government programs. While I have no wish to appear ungrateful and with all due respect, if I could borrow the money to feed my cattle with any expectation of paying it back, I would do that without government assistance. Although I have found that no matter how low the interest, if you can’t see how to pay it back, borrowing is not an option.

Thank you for your time and consideration today and let’s all pray for rain.

COW-CALF SPA KEY MEASURES SUMMARY FOR NEW MEXICO HERDS—1991-2003

[Number of Herds: 52; Herd Sizes: from 28 to 2,500; Total Cows: 28,775]

	Average	Weighted ²	Standard Deviation (+/-) ³	Coefficient of Vari- ation (%) ⁴
Production Measures				
Herd Related Measures				
Pregnancy percentage ¹	81.8	80.6	26.1	32
Calving percentage	84.3	85.8	15.3	18
Calving death loss based on exposed fe- males	3.5	3.1	3.8	107
Calf crop or weaning percentage	82.6	82.8	9.5	12
Actual weaning weight, steers and bulls	515.4	520.4	64.5	13
Actual weaning weight, heifers	482.6	483.0	56.5	12
Average weaning weight	497.8	499.3	573	12
Pounds weaned per exposed female	411.5	409.6	78.7	19
Other Physical Performance Measures				
Raised feed acres per exposed female	0.0	0.1	0.1	523
Grazing feed acres per exposed female ...	53.1	56.8	20.2	38
Pounds weaned per acre utilized by the cow-calf enterprise	8.8	7.8	3.6	43
Pay Weight Prices Per Cwt				
Weaned calf pay weight—steers/bulls	\$86.96	\$82.23	\$13.92	16
Weaned calf pay weight—heifers	81.38	76.32	13.68	17
Weaned calf pay weight—weighted aver- age	84.18	79.36	13.37	16
Financial Measures⁵				
Investment and Returns (ROA)				
Total Investment Per Breeding Cow— cost basis	\$2,644	\$3,350	\$2,053	78
Percent Return on Assets—cost basis	1.83%	2.64%	7.72%	422
Total investment per Breeding Cow— market value	\$3,915	\$5,008	\$2,716	69
Percent Return on Assets—market value	0.63%	1.37%	5.42%	860
Financial Performance				
Raised/Purchased Feed Cost per cow	\$58.09	\$65.32	\$26.90	46
Grazing Cost per cow	57.04	5039	58.80	103
Total Cost Before Noncalf Revenue Adjust- ment per cow	395.40	337.79	153.14	39
Total Cost Before Noncalf Revenue Adjustment per cwt	94.34	81.76	36.16	38
Total Cost Noncalf Revenue Adjusted per cow	365.51	302.97	145.37	40
Total Cost Noncalf Revenue Adjusted per cwt—Unit Cost	87.44	73.42	35.82	41
Net Income After Withdrawals per cow ..	-6.95	47.64	130.02	1,871
Net Income After Withdrawals per cwt ...	-3.47	10.63	32.49	937
Economic Performance				
Total Cost Noncalf Revenue Adjusted per cow	\$465.07	\$412.96	\$170.95	37
Total Cost Noncalf Revenue Ad- justed per cwt—Unit Cost	112.34	100.48	45.92	41
Net Income After Withdrawals per cow ..	106.51	-62.34	158.16	148
Net Income After Withdrawals per cwt ...	-28.37	-16.44	41.55	146

¹Based on pregnancy tested herds.²Weighted averages are calculated on number of breeding cows.³Standard deviation measures variability; 68% of the herds fall within one standard deviation (+/-) of the average.⁴Coefficient of Variation is the standard deviation expressed as a % of the average.⁵Measures are calculated on a pretax basis.

BLACK CATTLE RANCH, LLC—Bernalillo County, NM

[Precipitation History in Inches]

Month	Mean Temp	City Normal	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	Ranch Avg.
January	36	0.49	0.00	1.04	0.15	0.00	0.18	0.30	0.13	0.00	0.10	0.70	0.00	0.40	0.00	0.25
February	41	0.44	0.00	0.57	0.88	0.54	0.00	0.25	0.08	0.05	0.60	0.10	0.20	0.40	0.00	0.31
March	48	0.61	0.10	0.88	0.82	0.58	0.00	0.25	1.00	0.75	3.20	0.00	0.00	0.30	0.00	0.65
April	56	0.50	0.00	0.47	2.95	0.00	0.15	0.33	0.28	0.50	0.60	1.30	0.00	0.90	0.20	0.64
May	65	0.60	0.00	0.10	0.00	0.57	0.00	0.10	0.00	0.30	0.00	2.20	0.00	0.50	0.50	0.36
June	75	0.65	0.00	0.35	0.94	0.35	0.35	0.38	0.27	1.30	0.00	1.00	1.30	0.00	1.00	0.60
July—Critical	79	1.27	0.00	0.53	1.63	0.00	0.55	0.72	1.21	1.90	2.00	2.30	0.50	1.00	2.75	1.26
August—Critical	76	1.73	0.00	0.86	0.76	0.66	0.70	0.30	1.28	4.00	0.30	1.10	1.40	1.40	1.45	1.18
Monsoon		3.00	0.00	1.39	2.39	0.66	1.25	1.02	2.49	5.90	2.30	3.40	1.90	2.40	4.20	2.44
September	69	1.07	0.00	1.18	0.65	0.13	2.18	0.00	0.00	0.30	0.10	2.00	2.00	0.80	0.40	0.81
Total—Growing Season		5.82	0.00	3.49	6.93	1.71	3.93	1.83	3.04	8.30	3.00	9.90	5.20	4.60	6.30	4.85
October	57	1.00	0.00	0.57	1.31	0.88	0.87	0.15	2.48	0.10	1.20	0.00	1.10	0.20	2.05	0.91
November	44	0.62	0.00	0.00	0.66	0.70	0.28	0.23	1.03	0.00	0.70	0.60	0.30	0.00	1.80	0.53
December	36	0.49	0.00	0.00	0.13	0.00	0.43	0.30	0.15	0.10	0.00	0.40	0.00	0.00	0.75	0.19
Totals		9.47	0.10	6.55	10.88	4.41	5.69	3.31	7.91	9.30	8.80	11.70	6.80	5.90	10.90	7.68
Average—Actual		7.68														

The CHAIRMAN. Later we want you to describe briefly the best Federal program, the one that does the best for you. That will be interesting to find out. Thank you very much, Mr. White.

Mr. Mayor, Ray Nunley, village of Ruidoso. Terrific to have you here. Will you proceed?

**STATEMENT OF LONNIE R. NUNLEY, MAYOR, VILLAGE OF
RUIDOSO, NM**

Mr. NUNLEY. Thank you, sir. Thank you, Mr. Chairman, and thank you, Senator Bingaman, and also Representative Wilson for attending this today, and all the distinguished guests. We appreciate it in Ruidoso. I brought with me Mr. Rick Delaco, our in-house forester, as an expert witness on what we've done in Ruidoso to conserve water, and also to help with forest fire deprivation. Also, Ken Mosley, our water department manager, who's done a good job with what he's had to work with. So if you have any questions after this, I'll be glad to answer, or those two would also be available to you.

I have lived in Ruidoso for 40 years plus, and I have never known the Sierra Blanca not to have snowpack. We have no snowpack this year. And I don't mean a little bit, I mean none. And so you can see what we're faced with. I think most cities and towns and villages in New Mexico are battling on a daily basis for water, on water issues. We not only need rain, we need some updated laws to accommodate the villages and towns and cities. So I would look forward to that.

Mr. Chairman, on behalf of the village of Ruidoso, I'd like to thank you and Senator Bingaman for your leadership and assistance with regard to the challenges presented by the current drought conditions. Many people around the country and around the world think of New Mexico as a land of enchantment and a treasure chest of natural resources and cultural diversity. Ruidoso is that way. Ruidoso is a mountain community of 8,500 permanent residents located in south-central New Mexico at 7,000 feet elevation. From Memorial Day to Labor Day the population can swell to more than 35,000 people, staying in their second homes or local lodging. I'm proud to live in a place where families come to relax and recreate and happily add to the economic development of our community. Recreation and tourism are economic staples in many of the mountain communities in New Mexico and throughout the West.

The drought condition in the Ruidoso area is at a critical stage. In Ruidoso, water supply for the village is highly dependent on surface water and wells that rely on surface water recharge. With little or no snowpack to rejuvenate the streams and wells used for drinking water, the potential for major water rationing is very likely.

Eagle Creek and Eagle Creek wells supply approximately $\frac{3}{4}$ of the village's drinking water. Currently the flow in Eagle Creek is approximately .022 cubic feet per second, or ten gallons per minute. And the average flow recorded by USGS for the month of April is approximately 4.24 cubic feet, or 1,900 gallons per minute.

The Rio Ruidoso supplies approximately $\frac{1}{4}$ of the village's drinking water and is currently flowing at 1.7 cubic feet per second, or

763 gallons per minute. The records indicate the average flow for the month is 15.7 cubic feet, or 7,046 gallons per minute.

During the summers, as our population fluctuates, so does our water product. This can vary from 1.5 million gallons a day to 6 million gallons a day. If the water resources are not available to supply this tremendous range of demand, our community could see a severe economic impact, as could the rest of the communities in New Mexico.

With regard to the natural environment, the drought's effects have a dangerous potential as a catalyst and accelerant for wildfire. The current interagency effort and mandatory fuels management ordinances in the Ruidoso area focus on maintaining and protecting its values at risk to the catastrophic effects of wildfire.

Additional forest health effects of continued drought in New Mexico are the bark beetle and other insect outbreaks. Most experts will agree that the most effective remedy is to reduce the densities of trees through fuels management and thinning projects, which you all have helped us with, and I appreciate that. Trees already weakened and stressed due to overcrowding are susceptible to dwarf mistletoe and other forest pathogens. Prescribed fire is sometimes necessary to remove fuels from our forest floors. Drought reduces the windows of opportunity to implement this important step. Projects are not done and fuels remain on the ground. Sometimes projects that remove material through utilization reduce the need to burn, but are more costly.

Within our urban settings, parks and fields will be restricted from watering, reducing aesthetics and increasing the potential for allergies and injury. Economics could be affected if scheduled softball tournaments look elsewhere due to unfavorable conditions. Golf courses could be affected by less attendance. Trees continue to die as a result of lack of water. Water as a tool for fighting fires becomes scarce. And last but not least, the health, safety, and welfare of the public becomes at risk.

The water supply for the village is currently meeting the demand, but our water levels and our wells have dropped to 60 to 70 percent of total well depth. We would like to be able to deepen our well through the State engineer's efforts.

If this drought persists, the possibility of a moratorium on new construction, severe water rationing, loss of supply wells, and a need for emergency water supplies is conceivable. Water conservation is a must. We are currently in the fourth stage of a five-stage water conservation effort, and we've been there for some time. The Office of the State Engineer Water Use Conservation Bureau is currently working with the village of Ruidoso on a preliminary water audit that should result in information that will indicate where the village should be looking for lost water. Once the information is available, the village of Ruidoso will commence to eliminate all possible sources of water loss, resulting in increased water availability to the public.

Some areas that we're working toward that we feel could significantly help water supplies are: We are working toward having water audits performed; we are continuing to educate the public on the effects of water conservation; and we are continuing to search for additional water sources and water rights.

That's all I have, Mr. Chairman and Senator Bingaman. If you have any questions of me or of the people I brought with me, I'd be happy to answer them when it's appropriate.

The CHAIRMAN. We'll get back to you very shortly.

Mr. Trujillo, I failed to introduce you at the outset. Pleased to have you here as a member of this panel. Would you please proceed with your testimony.

**STATEMENT OF ARVIN TRUJILLO, EXECUTIVE DIRECTOR,
NAVAJO NATION DIVISION OF NATURAL RESOURCES**

Mr. TRUJILLO. Thank you, Mr. Chairman, Senator Bingaman. Good to see you both again. Again, I want to thank you for giving me the opportunity to speak. I come here on behalf of President Joe Shirley and the Division of Natural Resources. I'm the executive director for the Division of Natural Resources for the Navajo Nation.

As noted by the members of the panel here, I might as well just turn in the testimony they have given. Everything that they have said mirrors what is happening on the Navajo Reservation, be it livestock development, forestry, water infrastructure, community development, community infrastructure. All those areas are currently impacting the Navajo Nation as we speak today.

But I'd like to note also that the Nation, since I came on board with the Nation back in 1999 and since the drought really came into effect in 2002, we've learned quite a bit, and we've taken on a more proactive approach, rather than a reactive approach, in a lot of our work within the Nation.

One of the areas I'd like to briefly discuss, and it's part of the written testimony provided, is our work over at Navajo Mountain. Though it's not here in the State of New Mexico, it exemplifies what we're going through on the Navajo Reservation.

Navajo Mountain is a community of about 1,200 people located along the Arizona-Utah border. We have three schools in that area, and in 2002, there was a massive or an extreme water shortage in that area. The area is supplied by springs, and those springs are supplied by shallow aquifers, and those aquifers were drying up. As a result, they didn't have enough water to sustain the community, and we were looking at having to shut the schools down because we didn't have enough water to run the sprinkler systems.

And as a result, we then coordinated our efforts in the emergency response with the Indian Health Service, the BIA, and community members. We started hauling water at about close to \$4,000 a week out to that community, and that was sustained over that summer of 2002. We were able to sustain the schools and keep the children in school there, not having to bus them out. But again, a number of issues came up.

As a result of that, we began to coordinate our efforts not only with these agencies, but also with Coconino County, as well as the State of Utah, to devise ways to better address this issue of Navajo Mountain. We came up with a two-phase plan. The first phase was to develop a new water well in the community about 20 miles away, known as Inscription House. We've done that. We've upgraded the water system. We also are looking at developing additional storage tanks north of Inscription House to deliver water to Navajo Mountain.

Phase 2 is now to develop a waterline from Inscription House to Navajo Mountain. That will be about 20 miles of gravity flow to the area. We are currently working very hard to get that project in place. We've learned and we've developed on how to begin to address these issues.

But again, it becomes very apparent that if we become proactive and begin to look at this from a very—try to be as innovative as we can and look at cooperation from all entities, we find solutions. If we go at it from a reactive point of view, we end up spending a lot of money and putting a lot of effort in, and we don't solve the problem.

So again, other successes we've been able to achieve through our efforts working with the Bureau of Reclamation, the Fish and Wildlife Service, the New Mexico Office of the State Engineer. We've developed the New Mexico—I mean the San Juan River shortage sharing recommendations for the Navajo Reservoir. Again, those discussions were very tense in the beginning. There was a lot that we had to work through, but as a result of that, we've been able to monitor the reservoir level. We've been able to come up with agreed operational recommendations on how to run the reservoir. As a result, right now, Navajo Reservoir is at about 81 percent of its active capacity.

So again, those have been things that we've done to begin to address these issues, and it's been an ongoing process for us to address a number of areas here within the Navajo Nation.

Finally, in terms of what the distinguished senators are looking at, what we're seeing on the Navajo Reservation is, how do we better address the drought situation as we look at livestock development, as we look at water infrastructure? We have worked through the U.S. Department of Agriculture. I have worked with Chief Knight. But we've got to improve. The programs there are specifically targeted toward producers, but many of our tribal members don't interact very well on that level. And again, looking at Indian country as a whole, we've worked with the Department of the Interior, which has a different set of rules than how the Department of Agriculture works.

I think, with your help, maybe we need to revisit farm policy as it applies to Native American communities and Indian country as a whole to better bring these programs to us and help us with those benefits. As Mr. Perkins noted, we also were involved in the American Indian Livestock Program, helping us with the drought situation. We didn't get real participation with the Farm Service until the Navajo Nation became involved in that, and we took the lead working with the Farm Service to get that program going. Now we're getting applications coming through, and a number of our producers are beginning to see benefits from that program.

We've also seen benefits from the Water 2025 Program through the feasibility efforts or the feasibility studies that have to happen. We need more assistance there and more importantly, Senators, if there's a way we can work through those feasibility studies in terms of getting authorization for those studies from the agencies rather than having to work through Congress. Right now we have to go through a two-tiered system, where we have to go to Congress

to ask for assistance with feasibility, and then we have to ask for assistance on appropriations for that.

Finally, in coordinating our efforts, the Navajo Nation is very much focused on the drought. Right now the Navajo Nation Council is in session, and they are considering drought relief packages right now for our communities. We also have a drought mitigation program in place. We also have a task force in place, but again, we still need help with the Corps of Engineers. It's working through the policy aspects, and at times we have difficulties gaining access to those areas.

So again, I want to thank the Senators for this opportunity to come to you, and we have had successes, and I'm open to questions of the Senators. And again, thank you very much for this opportunity.

[The prepared statement of Mr. Trujillo follows:]

PREPARED STATEMENT OF ARVIN TRUJILLO, EXECUTIVE DIRECTOR, NAVAJO NATION
DIVISION OF NATURAL RESOURCES

Chairman Domenici and ranking member Bingaman, good morning and thank you for the opportunity to submit this testimony concerning the impact of the ongoing drought on the Navajo Nation. My name is Arvin Trujillo, I am the Executive Director of the Navajo Nation Division of Natural Resources. As

Senators from New Mexico, and important members of the delegation that represents the Navajo Nation, you are both keenly aware of the drought conditions confronting the Southwest and Navajo Nation. I thank you both for your tireless work in helping the Navajo Nation, to confront and address the effects of this ongoing problem.

I. WE LIVE IN AN ARID REGION, BUT WE ALSO FACE PERIODS OF EXTREME DROUGHT

On March 8, 2006, the Navajo Nation Emergency Management Commission and President Shirley reaffirmed a declaration of a thought emergency. This warning was triggered by the driest weather conditions that have confronted the Navajo Nation in decades. Even with a brief snowstorm in early March, the snowfall in the Chuska Mountains is significantly below average, and the current conditions and forecast indicate that by most measures we remain in a critical drought.

Due to the arid climate in this region, drought has always been a major concern. Navajo Nation residents, ranchers, farmers, and businessmen are subjected to frequent water shortages. The term "drought" is often inaccurately used to characterize all water shortage situations. However, the term "drought" is more accurately defined as a persistent and extended period of below normal precipitation causing abnormal moisture deficiency having adverse effects on people, animals and crops. Today we are experiencing a difficult and prolonged drought. It is a drought cycle that has had a stranglehold on this region since I began working for the Navajo Nation almost ten years ago.

A drought is the result of a number of interacting factors. The impacts of a drought vary depending on the water use sector. A drought can be defined by meteorological, agricultural, hydrologic or socioeconomic variables. Any one of these variables can be quantified using different indices. Furthermore, the beginning and end of drought events are not distinct. The Navajo Nation relies primarily on the six-month Standard Precipitation Index, a quantified standard for defining and declaring drought on the Navajo Nation.

II. DROUGHT RESPONSE: MITIGATION AND PROTECTION VERSUS
RESPONSE AND RECOVERY

One lesson we have all learned during the last ten years is that mitigation and protection are far more cost effective than response and recovery. One objective of drought mitigation is to reduce the expense of responding to drought emergencies when they occur. Emergency drought response is expensive and difficult to sustain over a long period. The Navajo Nation is adopting both long term and short-term mitigation strategies which will assist all of the Navajo stakeholders to be proactive before drought impacts become critical.

The Navajo Mountain Chapter best exemplifies the challenges facing the entire Navajo Nation regarding the ongoing drought. The Navajo Mountain Chapter is the

most isolated community within the Navajo Nation. Situated roughly 90 miles north of Tuba City, Arizona, the community is located in Coconino and Navajo Counties in Arizona, and San Juan County in Utah.

The Indian Health Service estimates that more than 70 percent of the households in this chapter do not have direct access to a public water system. Compounding the difficulty, the main public water system relies on springs that are not reliable. There are three schools at Navajo Mountain and surrounding areas that serve more than 150 students: Navajo Mountain Head Start, Naa Tsis Aan Community School, and Navajo Mountain High School. In the event of a fire at the community school or high school, Navajo Mountain had only two minutes of water available. If strictly applied, fire safety rules would have closed the schools.

Despite the rural location, Navajo Mountain is a growing community. More than 1,200 people live within Navajo Mountain Chapter. There are more than 350 housing units with plans for an additional 40 homes to be built by the Navajo Housing Authority.

During the summer of 2002, Navajo Mountain faced a devastating water shortage. The Indian Health Service, the Bureau of Indian Affairs, and hundreds of community members were forced to haul water from as far away as 80 miles. The cost of hauling water from other Navajo communities was estimated to be over \$3,500/week. The problem of hauling water was compounded by the difficulty in finding haulers who would risk their vehicles' axels on the 25 miles of unpaved roads that lead to the community.

The Bureau of Reclamation, the Bureau of Indian Affairs, the Indian Health Service, Coconino County, and the State of Utah came to the Chapter's rescue by working together to find ways to bring the needed water to the community. Out of that crisis came a consensus and a commitment to find a long-term solution. The Bureau of Reclamation Native American Affairs Office funded a feasibility study of water supply alternatives. The preferred alternative is a water line from Inscription House. The first phase of the water project is nearing completion. It was funded by the Bureau of Indian Affairs and the Environmental Protection Agency with extensive technical support from the Indian Health Service. The first phase includes a new well, upgrades to the Inscription House Public Water System, and additional storage on the north side of the Inscription House Chapter. The next phase will be a twenty-mile long gravity water line to the Navajo Mountain Chapter.

A water shortage of potentially similar severity is predicted for Summer 2006.

III. NAVAJO NATION SUCCESS IN RESPONDING TO THE DROUGHT

It might sound strange, but out of this most recent prolonged drought cycle a number of important successes have emerged.

1. *The recommendations for San Juan River operations and administration*

Four years ago, the San Juan Basin was facing a crisis. The storage level behind Navajo Reservoir was approaching a critical level. The largest water users got together and developed a plan to share their collective risk, and to implement major conservation measures. The resulting agreement, which is usually referred to as the San Juan River Shortage Sharing Recommendations, encourages the participants to conserve water early in the spring in order to avoid a crisis late in the summer. These recommendations have saved literally tens of thousands of acre-feet of water in Navajo Reservoir.

The Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the Office of the State Engineer should all get special recognition for the roles that they played in orchestrating this agreement as well as the other signatories including the Jicarilla Apache Nation, the City of Farmington, Public Service of New Mexico, Arizona Public Service, Hammond Irrigation District, BHP, Bloomfield Irrigation District, and Jewitt Valley deserve recognition. This agreement is a hard won success story.

Today the Navajo Reservoir stands at 81 percent of its active capacity. But no one is breathing easy. The major water users have again agreed this year to follow through on these recommendations. They are all willing to tighten their water usage this spring in order to reduce the likelihood of a crisis later this summer. Every acre-foot retained in Navajo Reservoir storage provides more flexibility in confronting the unknown hydrology this year and next.

2. *The Navajo Nation has improved its drought response*

Eight years ago, the Navajo Nation was late in declaring a drought emergency and in responding to the rapidly changing circumstances. Since then, the National Drought Mitigation Center has developed web-based information that gets current

conditions and forecasts into the hands of water managers. This vastly improved system for distributing information an essential tool and needs to be maintained.

Another part of the improved response has been by the Navajo Nation itself. The Bureau of Indian Affairs Water Planning and Pre-development Program and the Bureau of Reclamation Native American Affairs Office provided funding over a two-year period for the Navajo Nation to develop a drought response plan. This response plan follows the National Drought Mitigation Center guidelines. The Navajo Nation now relies on the Standard Precipitation Index as its primary response indicator. The Navajo Nation now has a response program that is based on a methodology that is very similar to those used by the States of New Mexico, Arizona and Utah. This response is now much more timely, and, equally important, it reduces chances of "crying wolf" because conditions at a particular point in time do not really merit a drought declaration.

As part of the Navajo Nation drought plan, the Division of Natural Resources established a drought task force that organizes the response of specific departments within the Division. According to this plan, as a drought intensifies, a monthly drought report is distributed to a widening list of recipients.

3. The Navajo Nation has made improvements in drought response and mitigation

As part of the drought response plan, the Division of Natural Resources assessed more than 80 public water systems in terms of drought risk. Criteria were established based on the number of water haulers in the area, lack of storage, and reliability of the water source. As one might imagine, the water users on a large number of these public water systems face considerable risk. Four years ago, the Navajo Nation developed a short list of water projects that were deemed especially suitable for drought mitigation work.

Of the ten projects on that list, the Coalmine Well Replacement and the Toadlena Fish Hatchery Well were implemented directly through resources provided by Reclamation. The Twin Lakes Well and the Spencer Valley to Manuelito Waterline Extension were facilitated by Reclamation's planning resources, and implemented by funding from the State of New Mexico. The Gray Mountain Extension was completed by the Indian Health Service. Additional emergency domestic water projects were completed with Reclamation assistance in Navajo Mountain, Torreon and Alamo. Additional water projects are nearing completion in Gap-Bodway and Tolani Lake. This list represents a very substantial accomplishment that would not have been possible without a superb effort by these agencies.

Based on this progress, and recognizing the current emergency conditions, the Navajo Nation Department of Water Resources, working closely with the Indian Health Service, updated the list of key drought water projects.

IV. NAVAJO NATION IS CONFRONTED WITH CHALLENGES IN RESPONDING TO THE DROUGHT

The recent prolonged drought cycle has created challenges that threaten the survival of the Navajo Nation.

1. The Navajo Nation faces difficult challenges

Even after more than 100 years of federal trusteeship, the Navajo Nation faces serious economic and social challenges. The Navajo Division of Economic Development reports that the median family income on the Navajo Nation is barely half the U.S. median family income. More than 50 percent of the Navajo families on the reservation live below federal poverty levels, compared with less than 13 percent of the general U.S. population, making it among the most impoverished regions in the United States. The unemployment rate on the reservation exceeds 40 percent. These disparities show no sign of narrowing. While the surrounding regional economy has boomed, these gaps in income, unemployment and poverty have widened.

The Navajo Nation faces serious water resource problems. Many homes lack indoor plumbing. More than 50 percent of Navajo homes lack complete kitchens and more than 30 percent of Navajo households haul water to meet their daily needs. Navajos use far less water per capita, yet pay among the highest water rates in the region. Their low per capita water use is part of a larger pattern of a lower economic standard of living.

Safe drinking water is a precondition for health promotion and disease prevention. The lack of clean, safe water results in a higher incidence of disease, poor health, and fire protection. In 1996, President Clinton noted that "the number one health problem in the developing world is the absence of clean, safe water."—Without access to safe drinking water, people are forced through a revolving door of expensive medical treatment and unhealthy conditions. In a report to Congress by the Comptroller General, it was noted that families living in homes with satisfactory en-

vironmental conditions placed only one fourth of the demands on IHS primary health care delivery systems than families living in homes with unsatisfactory conditions. Biological contaminants like *coli form* bacteria, *giardia*, and *cryptosporidium* can only be controlled by proper water source protection, treatment and distribution systems. Children living in homes without access to safe, affordable, and dependable drinking water are especially vulnerable.

These grim statistics threaten the survival of the Navajo Nation. According to the Division of Community Development, due to the stagnation of development in Navajo country, the Navajo Nation is losing population to off-reservation communities, the Four Corners Area, and the other 46 states. In recent decades the Navajo off-reservation population in New Mexico, Arizona, and Utah grew by 125 percent, the Navajo population in the other 46 states grew by 71 percent, while the on-reservation population grew by only 22 percent. Without reducing the out-migration, in a few years more than half of the Navajo people may be living off the Navajo reservation.

The lack of infrastructure, the lack of economic development, and sustained poverty are closely connected. Throughout the arid southwest, and especially on the Navajo Nation, a reliable water supply is essential for jump starting and sustaining economic development. The Navajo Nation has identified economic development growth centers throughout the reservation. These economic development centers represent large population bases that have the potential to benefit from an economy of scale in infrastructure development. Accordingly, the Navajo Nation will focus resources in these locations to stimulate economic growth.

Developing an adequate water infrastructure can create sustained economic growth, and a narrowing of the disparities between the Navajo people and the rest of the Nation. If improved water infrastructure can close the income gap by just one percent, the direct benefits to the Navajo Nation, and the indirect benefits to the federal government, will be worth tens of millions of dollars annually. For example, the Navajo Nation captures less than 8 percent of the \$660 million annual tourism revenue in the Four Corners Area. If an enhanced tourist infrastructure increases that percentage to 12 percent, the Navajo Nation economy could generate an additional \$26 million annually.

Current annual municipal water production on the Navajo reservation is approximately 15,000 acre-feet. Assuming that the economic and social condition can be improved, and that out-migration can be reduced, by the year 2040 the population of the Navajo Nation is projected to be approximately 500,000. If the disparities in water use between the Navajo people and the rest of the Nation can be reduced, the total annual municipal water demand on the reservation will exceed 89,000 acre-feet. This demand may require a six-fold increase in system capacity and regional municipal water projects. Overcoming the legacy of economic neglect and the readily apparent deficits in infrastructure will require a very aggressive water development program. One measure supported by the Navajo Nation is the Navajo Gallup Water Supply Project that will bring a sustainable water supply to more than 20 Navajo chapters in New Mexico and Arizona, the City of Gallup and the southern part of the Jicarilla Apache Nation.

2. The Navajo Nation's traditional agriculture suffers during prolonged drought

The importance of agriculture to the Navajo Nation cannot be overstated. In spite of droughts, harsh winters and fluctuating prices, traditional agriculture has historically been one of the few economic enterprises which has been successfully managed in the reservation environment. On the Navajo Nation there are more than 12,000 livestock permittees and hundreds of irrigation permittees. The Navajo Division of Economic Development estimates that in the Navajo reservation the value of cattle is \$16 million, the value of sheep is \$3 million, the value of horses is \$625,000, and the value of goats is \$375,000. The total value of livestock exceeds \$20 million. The cultural importance of livestock to the local community goes far beyond its monetary value. Livestock have been integrated into the Navajo lifestyle for many generations. The water for an estimated 300,000 permitted animal units comes primarily from 800 shallow windmill-powered wells and thousands of rain-fed stock-ponds.

The current drought has devastated the livestock industry because ranchers are far more sensitive to variations in range conditions than other groups. The Navajo Nation has found ways to address this problem through the distribution of improved range information.

3. Significant improvements are still needed in drought response and mitigation

The Navajo Nation Department of Water Resources, working closely with the Indian Health Service and Reclamation, have updated the list of key drought water

projects. This updated list includes the uncompleted projects from the previous list, and a few new projects:

1. Tuba City Additional Well	\$400,000
2. Teec Nos Pos New Well	\$460,000
3. Rare Metals to Tuba City Waterline Extension	\$280,000
4. Torreon/Counselor New Well	\$420,000
5. Baca/Haystack System Upgrades	\$755,000
6. Navajo Mountain Water Hauling	\$100,000
7. Lupton Additional Well	\$250,000
8. Cove Additional Well	\$250,000
9. Livestock Water Facilities	\$791,500
Total	\$3,706,500

These projects reflect only a small fraction of the infrastructure needs on the Navajo Nation. However, part of the selection criteria was that these projects can be implemented quickly, and they will address immediate water needs. This list was provided to the Commissioner of Reclamation for consideration early in March.

4. The Navajo Mountain water supply project remains unfinished

It may seem strange to consider Navajo Mountain both a success story and one of the greatest challenges. However, in spite of our recent efforts, there is still a long way to go before that community has a sustainable and reliable water supply. Based on Reclamation's estimate, completing the second phase of this project may cost approximately \$5 million. The Navajo Nation is committed to completing Phase 2 and bringing the waterline to this desperate community. An updated feasibility study was complete two weeks ago by the Indian Health Service, and clearances on the first few miles of Phase 2 were completed by Reclamation last week. Funding, however, remains elusive.

V. CONCLUSION

The Navajo Nation remains committed to facing this drought. The Navajo Nation's oversight committees are currently considering a thought relief package to assist the Chapters and the Tribal programs respond. The Navajo Nation is also closely coordinating with the local, state and federal agencies that may be equipped to assist with this response. I am confident that working together, we will be ready to meet this challenge.

The CHAIRMAN. Thank you very much.

Senator Bingaman, would you please lead off with questions?

When we finish our questions, before the second panel comes, we will seat them, but before we inquire of them, we'll take a 15-minute recess and start with the second panel. But we're going to question this panel first before we recess.

Senator BINGAMAN.

Senator BINGAMAN. Thank you very much. Thanks to all of you for your excellent testimony.

Chief Knight, let me ask you first, I would say the Natural Resource Conservation Service probably has tools at its disposal for analyzing and predicting drought as good as any of the Federal agencies; would you agree with that?

Mr. KNIGHT. Yes.

Senator BINGAMAN. I don't need a long answer to that. I just wanted the short answer.

Mr. KNIGHT. We're pretty good at forecasting streamflows.

Senator BINGAMAN. OK. Well, how far in the future can you forecast streamflows? I think in your testimony you say that 80 percent of extreme flow comes from snowpack.

Mr. KNIGHT. Yes.

Senator BINGAMAN. What can you tell us about the anticipated snowpack this next winter and the winter after that, as we go forward through the rest of this decade?

Mr. KNIGHT. The arena that we use the prediction and predictive efforts on is on an annual basis, based off of the existing snowpack, to be able to predict the streamflow in a given basin in a given watershed for this current year. We do not go into the outyears. We leave that for the weather forecasting.

Senator BINGAMAN. So you do not try to predict snowpack in the future?

Mr. KNIGHT. We do not, sir.

Senator BINGAMAN. There's a group called the Western States Water Council. Are you familiar with them?

Mr. KNIGHT. Yes, sir.

Senator BINGAMAN. They have developed a water action plan for the Western States, and as I have read through that, tried to understand it, one of their concerns has to do with the ramifications of climate change. Now, I think this gets you into questions about what's causing a drought, or what's causing some of these things, and they talk there about smaller snowpacks. They say there's already evidence of smaller snowpacks, more rain instead of snowpack, earlier snow melt. They say there's a fairly clear trend toward earlier snow melt, more evaporation and dryness in the soil. Do you have any agreement or disagreement, or do you take any position with regard to any of those issues?

Mr. KNIGHT. Our National Water Climatic Center—we will, with our SNOTEL service, be celebrating our one-hundredth anniversary this year, so in many areas of the West we have about 100 years of historical data. And that is giving us some reference and many of the people engaged in the climate change debate are using some of that data for some of their findings.

What we find is that with 100 years of data, that is still woefully short to be able to make any meaningful long-term climatic conditions. As an agency, we are very action-oriented, and so we stay very focused on what we can do for our farm and ranch customers in the here and now.

One of the things, as an example, the debate about earlier spring runoff is also sometimes managed or influenced strongly based off of the range management conditions there. And our grazing systems management can actually do a great deal to slow the runoff to make sure that water is there. Good, meaningful brush control will do the same thing, in order to be able to control the brush, reduce the evapotranspiration, increase the water flows. So we stay very focused on the pragmatic things to serve our customers in today's arena.

Senator BINGAMAN. Let me just ask about one of those practical things that I think you're involved in. You mentioned this ground and surface water conservation component, which was part of the Farm Bill. Do you know how much funding we have received in New Mexico as a result of that ground and surface water conservation effort?

Mr. KNIGHT. The ground and surface water conservation effort in fiscal year—this fiscal year, I believe, is about \$1.3 million. And many of the similar water conservation efforts are also done in the

Environmental Quality Incentives Program. For this year, I believe that is \$24 million for the State of New Mexico alone. And I would be very pleased to provide you with historical data since the passage of the 2002 Farm Bill.

Senator BINGAMAN. And you indicated some figure as to the amount of water that has been conserved as a result of those various programs; is that what I understood?

Mr. KNIGHT. Last year in New Mexico alone, the water conservation from these two programs was the equivalent of about 15,000 acre-feet.

Senator BINGAMAN. OK. And that would correlate with the \$24 million figure you just gave us?

Mr. KNIGHT. Yes.

Senator BINGAMAN. That was the Federal expenditure in order to save the 15,000 acre-feet?

Mr. KNIGHT. Yes.

Senator BINGAMAN. OK.

Mr. KNIGHT. It looks on balance to be a good rate of return. We are seeing routinely nationwide a 20 to 30 percent savings in water conservation that can be done on-farm with different types of irrigation technology, the right sort of measurements. In the middle of a drought, if you're in the fifth year of the drought and you can't get water, these tools don't help as much, but if you're spreading a limited amount of water over your acreage, this makes a great deal of difference, and it really hardens a farm operation for the future and the ability to respond throughout the weather changes.

Senator BINGAMAN. So I take it that when we write the new Farm Bill in Congress next year, you recommend us including and expanding this program; right?

Mr. KNIGHT. Secretary Johanns has done a series of listening sessions around the country and there certainly has been a great deal of support for these efforts. We are in the process of going to the next round of Farm Bill recommendations, and I fully expect the Secretary to have a set of recommendations to deliver to both the Senate and the House of Representatives in the near future.

Senator BINGAMAN. Why don't you go ahead, Mr. Chairman?

The CHAIRMAN. Thank you, Senator Bingaman.

Well, this sounds to me like this is a winner, so we hope to see it revisited with even more resources. These are the times when we need it, it seems to me.

I'm going to ask each one of you two or three questions based on your testimony, so let me start with you, Mr. Trujillo. You're aware that the San Juan Dineh Water Users Association received a 2025 grant in 2004; right?

Mr. TRUJILLO. Yes, I am.

The CHAIRMAN. And that when completed this fall, that will save 5,500 acre-feet a year of water. How will this 2025 plan benefit the Water Users Association that I have just referred to in the Dineh Association?

Mr. TRUJILLO. The way it will benefit the association is, it's going to help improve water delivery along different aspects of the irrigation system in the Cudeii and the Hogback areas. And again, the idea here is to get a measured amount of water throughout the

community there, as we go through those areas and as we work through the shortage sharing recommendations.

The CHAIRMAN. Now, normally, we do a program like this and we have a grant and a match, and generally those who will have to come up with a match are very reluctant to come up with the money. You had to come up with some money here, the Navajo Nation; how did you sell that?

Mr. TRUJILLO. Very difficult.

[Laughter.]

Mr. TRUJILLO. But no, Senator, we were able to work, through the mitigation efforts, with the different contractors as well as working with our producers. We were able to find funding through the recommendations, as well as through the treasury of the Navajo Nation to come up with the necessary match dollars to bring this project to realization.

The CHAIRMAN. So you believe if we continue this and you find projects like this, the Navajo understand its significance and you may be able to find the match in the future?

Mr. TRUJILLO. Again, that's what we're looking to achieve, and again, the idea here is to educate our constituencies on how to begin to work in this area. Again, there seems to be a tremendous amount of mistrust when we work with the Federal Government.

The CHAIRMAN. Right.

Mr. TRUJILLO. And it's just teaching our people how to work with the Federal Government.

The CHAIRMAN. Well, I think you have done an excellent job, and I commend you.

Let me talk a minute with you, Chief. You said in your testimony that up to 80 percent of the streamflows are derived from snowpack. Some parts of the State apparently have the lowest snowpack in 50 years. Which stream systems and reservoirs will be most significantly impacted by a lack of snowpack?

Mr. KNIGHT. Sir, I may need to give you some of this for the record.

The CHAIRMAN. Do what you can. Don't take too long. If it gets too burdensome, we'll let you do it later.

Mr. KNIGHT. Let me do it for the record, then, sir, because I need to pull that out of the technical data, as to which exact areas. Obviously, for the South, the further South you go in the State, the more dramatic the lack of snowpack has been. You do have some streamflows coming in out of Colorado, where there was a little more generous snowfall that is going to give you a little more reservoir capacity. But I'll submit the rest for the records.

The CHAIRMAN. All right. Well, currently, as an example, Rio Hondo and the Zuni Bluewater basins have no snowpack at this point. Do you predict that these basins will have any consistent streamflow for the remainder of the spring and during the summer?

Mr. KNIGHT. In many of these areas, at this stage of the year, we will be relying mostly upon existing reservoir storage for irrigation use.

The CHAIRMAN. Mr. Perkins, the NRC believes that this year streamflows on the Canadian River will compete with the worst on

record. How will you make do if that's the case? Have you thought of it in that context, and are you prepared for it?

Mr. PERKINS. Well, I don't know if there's any real way to prepare for something like that except to tighten the belt and put a little bit more water in the beans. But I think the streamflow is going to be gone. What most of the area will do, myself included, is we take what little bit of water we do get and we cut our acreage down, and so you get—my estimate would be, if we get six inches per acre, which is, like I said, about $\frac{1}{6}$ of the amount, we would divide our acreage down to $\frac{1}{6}$ and put that total amount of water on $\frac{1}{6}$ of the acreage.

I know several people have plowed $\frac{1}{4}$ of their crop land to get ready to plant, because we do know—we anticipate. So, as far as getting prepared for something like that, I think the best way we can do it is to rely on what information we've got. We have gone through 2003 and 2004 where we had even less water and we had no irrigation, so we're a little bit better prepared this year than we were for those 2 years. 2002 was a real wake-up call for everybody.

You had mentioned—I want to briefly mention some historical data. There are little records. I mean, about every 10 years, in our district alone, we have had a dry spell. We have never—until 2003, we had always been able to get at least one inch of water or two inches of water, that was our low one, but then we'd reprieve during the summer. But about every 10 years, we've hit one.

And what I think happened is, we had 20 years where we did not have a dry spell, and I think some of things got a little bit lax. But I think after going through this, I believe we are prepared and we will handle that by cutting down the amount of acres we do and putting all that water in one spot. But that will also mean that that water will only run for a short period of time, because it will all be used up quickly.

The CHAIRMAN. Mr. White, let me just ask two questions of you: One, obviously, the rancher needs to feed more under these conditions, which means he has to buy more hay.

Mr. WHITE. Correct.

The CHAIRMAN. Has the price of feed increased proportionately during this drought, or how has the market reacted?

Mr. WHITE. Well, if you can find it, it's increased in price.

The CHAIRMAN. So it's short.

Mr. WHITE. To get through June, I had to get a load recently, and to give you an idea, it was running \$120 a ton at the end of the fall, last fall. Last month it was \$165 a ton. And that's not for real top quality alfalfa. That's for what we call number 2.

The CHAIRMAN. Now, my second question, since I asked of you—but I'll also ask Mr. Perkins to comment, if he'd like. I ask you, because you have a broad experience with clients. What's the best Federal program that you and other ranchers have used to mitigate disaster losses?

Mr. WHITE. Well, I mean, obviously, in the heat of the battle, currently it's the Livestock Disaster Assistance Program. I mean, we're making decisions now whether to feed them or sell them. We've got to get these cows bred if we're going to have revenue in 2007, and so they have got to be in good enough nutritional shape to breed, as well as raise their current-year calf. And so that deci-

sion tree is being done now. If we know we have some disaster assistance that's going to be available, that will influence that financial decision, whether they're just going to haul them to town and sell them, or whether they're going to try to acquire more feed when available and work through this thing.

The CHAIRMAN. Mr. Perkins, you agree that that's the best program?

Mr. PERKINS. Yes, I currently would have to agree on that. I have a little bit of difference that I do farm and ranch. But that Livestock Assistance Program has helped many of us and many ranchers that don't farm on their own. And if that program could continue it would be, I think, a saving grace to a lot of people.

I would like to comment a little bit on some of your other programs like the 2025 grant, those for the farming side of my thing. And all of the constituents—I'm also on the board of directors of the Arch Hurley Conservancy District, and the 2025 grants and some of the other water conservation grants that have been given, those are definitely excellent programs and we've got to keep them on board. We did have a 2025 grant that we thought would improve, but there was a slight glitch. Somehow we had not put one signature on there, so we lost that grant. And I would like to hope for people maybe to look into those. One signature does not equate to losing the amount of water we would have saved by putting in a pipeline to save some of that water. And so I hope if we can re-apply, we'd look at that, and I appreciate Ms. Wilson, as she was commenting that she's going to try to work on that.

But those programs like that, Senator, we can't get along, I don't think, as ranchers and farmers, without them. And not just there, but my area, too. Every one of us are looking at, "Do we keep them or do we sell them?" And you know, when you—I could ask some of the visitors if they want to put themselves in our place right now, take your annual salary and cut it by 65 percent, and see if you could still make your mortgage payments and your house payments and your health insurance. Health insurance is a big issue on farms and ranches, because you don't have the employer paying the other half, you know. But yes, those programs definitely help every farmer and rancher out there, Senator. Thank you.

The CHAIRMAN. Senator Bingaman.

Senator BINGAMAN. Well, thank you all very much. Let me just ask Chief Knight about this issue of declining underground aquifers. To what extent does your agency involve itself in trying to assess the extent of the decline in underground aquifers? It seems like we've had this history of drought periods, and one way to get through those is to rely more on the underground water than otherwise. And Mr. Perkins testified to drops in groundwater levels in the aquifer that he depends upon, and others that he's aware of.

To what extent are you trying to solve that problem or deal with that problem in a meaningful way in your agency?

Mr. KNIGHT. The ground and surface water conservation program that I mentioned, part of the underlying statute and intent was, in fact, to be able to address the aquifer challenges of the severe drawdown that is occurring in some of those aquifers. So with that program, we, in fact, allocate the dollars for that program to States

based on the amount of drawdown that's going on in that area, and so we do not even offer that program nationwide. We offer that primarily in the 17 Western States, and a few other Eastern States with aquifer recharge problems, as well.

But one of the primary determining factors for the use of that program and the funding for that program is the severity of the recharge need. And so a majority of the funds, historic, in the last few years have been going to those areas that are served by the Ogallala Aquifer from Nebraska all the way down to Texas and New Mexico, because of the severity of that problem and the lack of recharge.

Senator BINGAMAN. And do you depend, as I think you do depend, on the Geological Survey to provide you with data as to how much of a drop there is in those aquifers? Is that accurate? Do you do that yourself?

Mr. KNIGHT. For that particular formula, yes, we're tapping into USGS data and any other reliable data that's out there, to ensure that those formulas are as accurate as they possibly can be.

Senator BINGAMAN. OK.

Mr. KNIGHT. As you get into the smaller aquifers, it does get more challenging to be able to really measure the severity of that drawdown for the purpose of, on my level, appropriating money to the State. And then most importantly in the State, the State conservationist, in consultation with the State technical committee, the farmers and ranchers and the interest groups in the State, determines the priorities of where we should allocate resources in that State, and what should be the highest priority. Is it soil conservation? Is it water quality? Is it water quantity? And that sort of data at the local level is extraordinarily important for a community to make that sort of prioritization decision.

Senator BINGAMAN. Let me just ask one other question of Ray Nunley. There, in Ruidoso, you mentioned, I believe, that a lot of the thinning activity that has occurred has been helpful, particularly in reducing the fire danger. Is it your information that the thinning that has occurred in and around Ruidoso has also benefited the community, by virtue of helping with water supply and recharge of wells, or is it possible to even judge that this soon into the process?

Mr. NUNLEY. Senator Bingaman, I have been told that that, in fact, is the case. I know that you have seen our efforts there to clear up the fire danger part of the community there toward the Upper Canyon. I have been told—and I have never seen a tree drink, but I have been told they drink about 30 or 40 gallons of water a day, a big tree does, so yes, it has helped. We're going to continue on that effort with your help, and I know that you have done a good job for us, and we'll be coming to Washington in a couple of weeks, and we'll be the ones on our knees asking for more money.

[Laughter.]

Mr. NUNLEY. But it has helped some, and unfortunately, we're not able to keep up with the drought that's really affecting it. If we don't get some rain soon, we'll be going into phase 5, which means that you can't wash your car, you can't do a lot of things that people like to do. At the present time we're allowing drip sys-

tems only and hand watering, and that's all we're allowing in the village.

So we're doing everything we can to keep up, but it's kind of a losing battle, like it is with these other gentlemen, and I really am distressed with the fact that the farmers are having such a difficult time, because our economy depends on them, too.

The CHAIRMAN. Senator Bingaman, is that adequate?

Senator BINGAMAN. Sure.

The CHAIRMAN. All right. We might submit additional questions. If we do, we'll tell you how long we can give you with opening the record to let you submit them, but I don't think we'll have very many additional ones.

Thank you. You have been excellent. We're in recess for 15 minutes.

[Recess.]

The CHAIRMAN. Could we get started, please? All right. For those who are going to come back, it would be nice if we could get started now. Thank you. Now, the second panel is ready. And we're going to start with the Honorable Mark Limbaugh, Assistant Secretary of Water and Science, U.S. Department of the Interior. We're very grateful that you would take the time and make the effort to join us. Thank you, Mr. Secretary.

José Otero, chairman of the board of the Middle Rio Grande Conservancy District. He is accompanied by Sterling Grogan, biologist and planner. And John D'Antonio, New Mexico State engineer and secretary, Interstate Streams Commission. We thank you for being here, but we also thank you for your terrific work for the State of New Mexico.

And Mike Hightower, distinguished member of the technical staff at Sandia National Laboratories, thank you for being here. We could take a lot more time with you, but we'll have to get by with a little bit today, and perhaps do some additional inquiring at another time.

We're going to start with you, Mr. Secretary. Would you please lead off? Thank you for being here.

**STATEMENT OF MARK LIMBAUGH, ASSISTANT SECRETARY
FOR WATER AND SCIENCE, DEPARTMENT OF THE INTERIOR**

Mr. LIMBAUGH. Well, Mr. Chairman, Senator Bingaman, thank you for inviting me. I appreciate the opportunity to appear before this committee today to talk a little bit about the severe conditions facing New Mexico, and its drought. I'm also here today to highlight how S. 2561, recently introduced by you, Mr. Chairman, to authorize our Water 2025 Grant Program, can help the State of New Mexico and other arid Western States deal with such droughts and with the other pressures on our valuable resources. I want to thank you, Mr. Chairman, and also thank Congresswoman Wilson for introducing this legislation.

In listening to my colleague, Chief Knight, the NRCS talk about the dire runoff and reservoir conditions here in New Mexico and I, too, am truly concerned about the effects of drought on the people and communities of New Mexico today. I know that the Bureau of Reclamation, which is one of the Bureaus that I'm responsible for in the Department of the Interior, is helping its contractors prepare

for those dry conditions, and is preparing also to assist the pueblos and tribes, real communities, and the endangered species in the basin through their Native American and emergency drought programs.

Obviously, the best time to prepare for drought is not just during a drought, but every year in the West. And as we all are aware, drought conditions are not uncommon in Western States, and tend to magnify many of the underlying pressures on water resources in the West that will not go away when the rains and snows return.

Water 2025 was fostered by former Secretary of the Interior Gail Norton to recognize that we are dealing with realities in the West that will ultimately cause conflict and crises over water, sometimes pitting neighbor against neighbor, farmers against fish and wildlife, and cities against rural communities. The crises that result are simply not acceptable in today's world. Western States like New Mexico are dealing with reality such as increasing water demands due to rapid population growth, environmental needs, endangered species requirements, and, yes, record drought. They're also dealing with realities such as overallocated watersheds, lack of adequate stored water even in normal water years, and aging facilities used to manage and deliver water supplies to ever-thirsty farms and communities. And we recognize the very real fact that crisis management is not the way to deal with these issues.

Today we must search out and promote innovative, proactive, locally-based approaches to prepare for the inevitable droughts while also dealing with the larger realities I have just mentioned. These realities make the impacts of drought like the one New Mexico this year is facing much worse than ever before. The tools Water 2025 relies on include improving water conservation efficiency and management, increasing collaboration among stakeholders, and removing Government's barriers to success. They are all essential to heading off conflicting crises over water before they occur, especially in areas of the West where we can predict them.

S. 2561 permanently authorizes the Bureau of Reclamation to enter into 50/50 cost-shared grants and cooperative agreements to encourage projects that use these tools to get ahead of problems. Recently such authority has only been provided annually through the appropriations process. During the past 3 years, Reclamation has been using competitive grants and cooperative agreements to fund projects that further the philosophy of Water 2025, partnering with water districts, irrigation districts, tribes, States, and other water delivery organizations in the areas of the West ripe for conflict and crisis.

The fruits of these investments cannot be overlooked: Sixty-eight projects estimated to conserve over a quarter-million acre-feet of water annually in 16 Western States, and representing a total value of almost \$60 million, all leveraged by a Federal investment of only \$15 million. These projects include improvements to aging infrastructure, to better and more effectively manage water supplies, increasing the use of water banks and markets, and collaborative efforts to bring communities together to face these tough water issues.

As Congresswoman Wilson pointed out, New Mexico has directly benefited from these grants, and will continue to benefit from the

projects funded by Water 2025 well into the future. Increased water supplies have resulted from several water management improvement projects funded through cost-shared grants to the Middle Rio Grande Conservancy District, the State of New Mexico, the New Mexico Interstate Stream Commission, the San Juan Dineh Water Users Association, the city of Las Cruces, and the Elephant Butte Irrigation District. All of these projects have been designed not only to provide relief from today's drought, but also to continue to empower locally-driven solutions to many of the water problems here in New Mexico.

Also, competitive cost-shared grants of funded partnerships for advanced water treatment research in order to improve today's technology to better meet tomorrow's needs. Just last year 16 pilot research and demonstration projects were funded, which represent a total investment of \$6 million in research and development projects to improve water purification technologies such as desalination.

In closing, Mr. Chairman, Mr. Bingaman, Reclamation has programs that help deal with the effects of drought, but these programs are not designed to deal with the many other realities the West faces when managing their water resources. Water 2025 is a program that has now proven itself in stretching both western water supplies and Federal, State, and private dollars to meet the many water supply challenges we currently face here and across the West. And S. 2561 is a crucial step in ensuring this program and its philosophy continues well into the future.

Thank you for inviting me to testify today. I certainly will be happy to answer any questions you may have at the end of this panel. Thank you.

[The prepared statement of Mr. Limbaugh follows:]

PREPARED STATEMENT OF MARK A. LIMBAUGH, ASSISTANT SECRETARY FOR WATER
AND SCIENCE, DEPARTMENT OF THE INTERIOR

Mr. Chairman and Members of the Committee, I am Mark Limbaugh, Assistant Secretary for Water and Science, U.S. Department of the Interior. I am pleased to appear today to talk about the drought conditions currently facing the State of New Mexico, and about how the Water 2025 program and legislation will work to address Western water supply needs.

INTRODUCTION

Chronic water supply problems in many areas of the West are among the greatest challenges we face in the coming decades. We are experiencing increasing demands for water as a result of exploding population growth, increasing water needs of urban areas, settlement of Indian water rights claims, and ecosystem needs, including compliance with the Endangered Species Act. These demands run up against limits imposed by already over-allocated watersheds and aging facilities even in non-thought years. The extended drought that we are currently experiencing magnifies already-stressed water supply conditions, particularly in important river basins such as the Middle Rio Grande and the Colorado River Basin.

Crisis management is not an effective response to drought, nor is it an effective solution to long-term, systemic water supply problems. Today's water supply issues require innovative, locally-based approaches that identify solutions in advance of water supply crises. The *Water 2025* program embodies these principles. Through its competitive Challenge Grant program, *Water 2025* recognizes that State and local governments should play leading roles in meeting the West's water supply challenges, and that the Department of the Interior should focus its attention and existing resources on areas where scarce Federal dollars can provide the greatest benefits to the West and the rest of the Nation.

The tools that the *Water 2025* program relies on, including improved water management through conservation, efficiency and markets; removing institutional barriers to coordination; increasing* collaboration among stakeholders; and researching and developing new technologies, are essential to heading off problems before they occur. *Water 2025* also complements Reclamation's Drought Program, which is designed to help plan for drought events and to respond to an emergency situation if it occurs. Both these programs help armor water users against the impacts of drought by maximizing the amount of water available under drought conditions. My statement today will discuss both of these programs, focusing on how they are being applied in New Mexico and throughout the West.

WATER 2025: PREVENTING CRISES AND CONFLICT IN THE WEST

Water 2025 is designed to enable Reclamation to take action in advance of a water supply crisis by focusing Federal financial and technical resources on geographical problem areas, or "Hot Spots," identified on the Potential Water Supply Crises by 2025 illustration (the "Hot Spots Illustration"). As shown on the Illustration, there are numerous Hot Spots in New Mexico, including the Rio Grande and Pecos River Basins. The Hot Spots Illustration is currently being updated to reflect the current state of water conflicts in the West.

A key element of *Water 2025* is the Challenge Grant Program, which relies on local initiative and innovation to identify and formulate the most sensible improvements for local water systems. *Water 2025* promotes improved water management through modernizing facilities, establishing alternative strategies such as water banks, and taking advantage of water markets. To foster innovative solutions, *Water 2025* creates partnerships and promotes collaboration with state and local water management agencies.

The Challenge Grant program seeks out projects at the local level that stretch existing water supplies. Reclamation funds up to 50% of the costs of implementing such projects. Examples of activities funded under *Water 2025* include canal lining and piping, installing measuring devices and automation technology to better control water deliveries and management, and creating and expanding water markets.

Water 2025 authorizing legislation was introduced in the Senate by U.S. Senator Pete Domenici on April 6, 2006, as S. 2561. If enacted, S. 2561 would provide long-term authorization for the *Water 2025* Challenge Grant program, and expand Reclamation's authority to enter cooperative partnerships for research and development of water management issues. For the first two years of *Water 2025*, Fiscal Years 2004 and 2005, *Water 2025* was funded through the annual appropriations process, which also provided year-to-year authority for the Challenge Grant Program. The ten-year authorization provided in Senator Domenici's bill will ensure the long-term effectiveness of *Water 2025*.

S. 2561 authorizes the Secretary to enter into grants and cooperative agreements with Western States, Tribes, irrigation districts, water districts, or other organizations with water delivery authority. Consistent with the existing *Water 2025* program, under these grants and cooperative agreements, the Federal government would fund up to 50% of the cost of improvements that will conserve water, increase efficiency, facilitate water markets, enhance water management, or implement other actions to prevent water-related crises and conflicts. Projects funded under the authority must be located in watersheds with a nexus to Federal water projects in the West. Grant and cooperative agreement funding awarded under the bill is non-reimbursable:

If *Water 2025* is to have a future, it must have long-term authorization. S. 2561 is largely consistent with the Administration's legislative proposal for permanent authorization for the *Water 2025* Program. The Department is committed to working with the Committee on Energy and Natural Resources and the House Resources Committee to secure passage of this critical bill. Passage of S. 2561 will ensure that irrigation and water districts, Western states, Tribes, and other non-Federal entities with water delivery authority can leverage their funding and thus have incentives to propose innovative solutions to pressing and long-term water management challenges. *Water 2025* is key to enabling the Bureau of Reclamation to reward flexibility and innovation and proactively address potential conflicts over scarce water resources. The Administration is pleased to support this bill.

Water 2025 has proven that leveraging Federal dollars with our partners can provide on-the-ground improvements in water management infrastructure that can help prevent water crises where they are most likely to occur. To date, Reclamation has awarded funding for 68 Challenge Grants in 16 states, including 62 projects by irrigation and water districts and 6 more by Western states. Collectively, the 68 projects represent almost \$60 million in improvements, including a non-Federal con-

tribution of \$44 million and a Federal government contribution of \$15 million. In other words, for every dollar the Federal government has invested, there has been about \$2.90 in non-Federal investment. Based on estimates in the project proposals, the 68 funded projects collectively could save up to 285,000 acre-feet of water per year once fully implemented.

In addition to the Challenge Grant Program, *Water 2025* has also funded cost-shared, competitive grants to improve water purification technology and make it more affordable. In FY 2005, 16 pilot, research and demonstration projects were funded. Including non-Federal cost share contributions, the 16 projects represent a \$6 million investment in improving water purification technology. S. 2561 includes a provision providing long-term authorization for this important research effort.

In the past year, the Department has been working closely with the Office of Management and Budget (OMB) to develop long-term strategic planning goals and performance measures for *Water 2025*. The long term goals include increasing water supply certainty and flexibility, diversifying the water supply, and preventing crises through added environmental benefits in many watersheds, rivers and streams in the Hot Spot areas. Use of these performance measures to track our progress toward achieving the program's strategic goals will ensure that the on-the-ground achievements of the program are maximized and will strengthen our accountability to stakeholders.

WATER 2025 EFFORTS IN NEW MEXICO

Since the inception of *Water 2025* in 2004, over \$5 million in Federal program funding—along with matching private and state contributions—has been committed to addressing water supply issues in New Mexico. This funding supports partnerships with the Middle Rio Grande Conservancy District and the New Mexico Interstate Stream Commission, as well as Challenge Grants to the San Juan Dineh Water Users Association, the City of Las Cruces, the Elephant Butte Irrigation District, and the State of New Mexico.

Partnership with the Middle Rio Grande Conservancy District (FY 2004, 2005, and 2006)

Reclamation entered into a 50-50 cost-share partnership with the Middle Rio Grande Conservancy District in 2004 to implement water efficiency improvements inside the District. Planned improvements include the automation of water control structures, improved water measurement, canal lining, and pipe systems. Reclamation has committed \$2,540,925 to these efforts to date, and has dedicated approximately \$1 million more in FY 2006. Through this partnership, the District has installed new software to upgrade its supervisory control and data acquisition (SCADA) system. Several water control gates have been installed at key locations, which will provide automated control and measurement at those sites. These improvements will provide better service to District water users and assist in meeting the requirements of the Endangered Species Act for protection of the Rio Grande silvery minnow.

Partnership with the New Mexico Interstate Stream Commission (FY 2006)

In 2006, Reclamation is entering into an agreement with the New Mexico Interstate Stream Commission (ISC), providing approximately \$1 million in *Water 2025* funding to improve water efficiency and supplement water supplies on the Pecos River. The funding will be used for pipelines that will deliver water from wells in the Seven Rivers area to augment Brantley Reservoir.

State of New Mexico (2005, Water 2025 Western States Grant)

The State of New Mexico will rehabilitate a Pecos River gage so that New Mexico's deliveries to Texas under the Pecos River Compact can be measured more reliably. Accurate measurement of water delivered to Texas is a critical step in helping to avoid conflicts between New Mexico and Texas. The total project will cost \$146,660 with a *Water 2025* contribution of \$59,480.

San Juan Dineh Water Users Association (2004, Water 2025 Challenge Grant)

The San Juan Dineh Water Users Association (Association), which serves water users in the Navajo Nation near Shiprock, New Mexico, is using its Challenge Grant to replace three unlined canal laterals with underground pipelines, potentially saving 5,500 acre-feet of water per year for the Association's water users. The Association has completed work on one of the laterals and will begin construction on the other two this fall. This project will decrease demand on the San Juan River, which will benefit the endangered Colorado pikeminnow and the razorback sucker. The total project cost is \$751,000, with a *Water 2025* contribution of \$200,000.

City of Las Cruces (2005, Water 2025 Challenge Grant)

The city will install pumps on the Elephant Butte Irrigation District water distribution system so that the city's Bum Lake can be used as a regulating reservoir for storm water runoff, operational spills, and irrigation water. The city also will install pumps so that Elephant Butte Irrigation District water stored in Burn Lake can be returned to the district as needed. The project is expected to save 3,750 acre-feet of water a year. The total project cost is \$174,889, including a *Water 2025* contribution of \$86,350.

Elephant Butte Irrigation District 2005 Water 2025 Challenge Grant

The district will install 100 flow control meters to implement its metering and monitoring plan to meter all farm deliveries using telemetry. The project is estimated to save 8,000 acre-feet of water per year, with 75,000 acre-feet better managed. The total project cost is \$615,000, including a *Water 2025* contribution of \$300,000.

In addition to the *Water 2025* projects outlined above, Reclamation works proactively with Pueblos and tribes throughout New Mexico through its Native American Affairs Program, to assist with a variety of water resource needs. Several of these projects complement *Water 2025* program efforts to improve water management on the Middle Rio Grande and its tributaries. Four hundred thousand dollars has been provided to the Pueblo de Cochiti through a Self-Determination Act contract for rehabilitation of Middle Rio Grande Conservancy District ditches that serve the Pueblo. The Native American Program has also funded projects for irrigation system improvements at the Pueblos of Sandia, Santo Domingo, and San Felipe.

Drought Program Efforts in New Mexico

Reclamation's approach to addressing drought conditions begins with storing water for times of shortage. During the recent prolonged drought, our reservoirs have performed well, meeting water requirements in most areas of the West.

Reclamation responds to drought emergencies using its authority under the Reclamation States Emergency Drought Relief Act of 1991. Title I of the Drought Act provides Reclamation with the flexibility to meet contractual water deliveries in times of drought by allowing Reclamation, on a nonreimbursable basis, to buy or lease water for fish and wildlife benefits, helping to meet requirements under the Endangered Species Act and to alleviate pressure on contractors' water supply. Since Fiscal Year 2000, approximately \$6.25 million has been spent through the Drought Program in New Mexico on water acquisition projects, primarily on the Middle Rio Grande and on the Pecos River, along with approximately \$2.2 million spent on well projects. The authority for Title I expired on September 30, 2005, but S. 648, legislation to extend the expiration date to 2010 has been passed by the Senate, and companion legislation in the House, H.R. 2925, received a hearing in the House Resources Subcommittee on Water and Power on September 27, 2005.

Additionally, the Drought Act includes provisions for Reclamation participation in water banks established under state law; facilitation of water acquisitions between willing buyers and sellers; acquisition of conserved water for use under temporary contracts; and use of facilities for storage and conveyance of project and nonproject water. The Drought Program focuses on improving management of existing water supplies during times of drought rather than on increasing storage; the only permanent construction authorized under the Act is groundwater wells. Reclamation's Drought Program is often the last resort for smaller, financially-strapped entities, such as towns, counties, and Tribes that lack the financial capability to deal with the impacts of drought.

Reclamation also actively engages in drought planning, working with States—including the State of New Mexico—water users, and other entities to prepare in advance so that when drought occurs there is agreement on the appropriate response. Reclamation's Water Conservation Field Services Program addresses drought conditions on a proactive basis, providing technical advice and cost-share financing for water management and conservation improvements before a drought hits.

Reclamation is also working closely with other Federal agencies, associations and water users both at the Reclamation project level and at the agency level to stretch otherwise limited water supplies and to protect water users during droughts. For example, Reclamation is working with the USDA to deploy drought action teams in drought stricken areas of the West to coordinate the communication and delivery of drought-relief resources, and is working to deploy such a team in New Mexico. Reclamation has also established an agreement with the Army Corps of Engineers and other partners to cooperate on water management programs and activities. Finally, in operating our facilities, we work closely with other agencies to monitor and

share data on water conditions and to coordinate water management to help minimize effects of the drought on communities and citizens of the West.

CONCLUSION

The Bureau of Reclamation has a long history of effective and responsive water management in good times and bad. I believe the efforts I have outlined today demonstrate that the Bureau of Reclamation is providing leadership and innovation in assisting the West to meet the tremendous challenges of the future. To enable us to continue to improve existing water management strategies, the Administration urges passage of S. 2561, which will effectively focus limited resources as the Department of the Interior works with States, Tribes, local government, and the private sector to meet water supply challenges.

That concludes my testimony. I am pleased to answer any questions.

NEW MEXICO

[Fiscal Year 2001 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0
Conservation Security Program (CSP)	0	0	0	0
Conservation Reserve Program (CRP)	900	0	0	900
Environmental Quality Incentives Program (EQIP)	1,106,800	4,975,822	29,000	6,111,622
Ground and Surface Water Conservation (GSWC)	0	0	0	0
Klamath Basin (KB)	0	0	0	0
Farm and Ranch Lands Protection Program (FRPP)	0	0	0	0
Grassland Reserve Program (GRP)	0	0	0	0
Wetland Reserve Program (WRP)	15,000	0	0	15,000
Wildlife Habitat Incentives Program (WHIP)	20,800	135,760	0	156,560
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance	9,137,652	0	0	9,137,652
Plant Material Center (CO 46)	271,400	0	0	271,400
Snow Survey (CO 45)	109,800	0	0	109,800
Soil Survey (CO 02)	1,194,900	0	0	1,194,900
Flood Protection Operations (WF 03)	0	0	0	0
Watershed Rehabilitation (WF 07)	0	0	0	0
Small Watershed Operations (WF 08)	1,137,150	1,196,957	0	3,054,107
Emergency Watershed Protection	358,441	761,179	0	1,119,621
Watershed Planning (PL 06) ..	40,400	0	0	40,400
Forestry Incentive Program ...	0	0	0	0
Resource Conservation and Development (RC&D)	815,900	0	0	815,900
Total Obligation	14,209,144	7,789,718	29,000	22,027,862

NEW MEXICO

[Fiscal Year 2002 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0

NEW MEXICO—Continued

[Fiscal Year 2002 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Conservation Security Program (CSP)	0	0	0	0
Conservation Reserve Program (CRP)	500	0	0	500
Environmental Quality Incentives Program (EQIP)	2,006,299	11,269,574	0	13,275,774
Ground and Surface Water Conservation (GSWC)	259,830	1,258,016	0	1,517,846
Klamath Basin (KB)	0	0	0	0
Farm and Ranch Lands Protection Program (FRPP)	0	0	0	0
Grassland Reserve Program (GRP)	0	0	0	0
Wetland Reserve Program (WRP)	0	0	0	0
Wildlife Habitat Incentives Program (WHIP)	28,000	126,687	0	154,687
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance	7,918,770	0	0	7,918,770
Plant Material Center (CO 46)	216,273	0	0	216,273
Snow Survey (CO 45)	146,025	0	0	146,025
Soil Survey (CO 02)	1,181,134	0	0	1,181,134
Flood Protection Operations (WF 03)	0	0	0	0
Watershed Rehabilitation (WF 07)	42,407	0	0	42,407
Small Watershed Operations (WF 08)	1,175,000	5,500,000	0	6,675,000
Emergency Watershed Protection	653,899	4,082,777	0	4,736,677
Watershed Planning (PL 06) ..	46,471	0	0	46,471
Forestry Incentive Program ...	0	0	0	0
Resource Conservation and Development (RC&D)	921,100	0	0	921,100
Total Obligation	14,595,611	22,237,055	0	36,832,665

NEW MEXICO

[Fiscal Year 2003 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0
Conservation Security Program (CSP)	0	0	0	0
Conservation Reserve Program (CRP)	24,800	0	0	24,800
Environmental Quality Incentives Program (EQIP)	3,519,500	13,251,209	0	16,770,709
Ground and Surface Water Conservation (GSWC)	200,000	1,062,730	0	1,262,730
Klamath Basin (KB)	0	0	0	0
Farm and Ranch Lands Protection Program (FRPP)	35,838	1,388,055	0	1,423,893
Grassland Reserve Program (GRP)	494,700	1,544,904	0	2,039,604
Wetland Reserve Program (WRP)	0	20,000	0	20,000
Wildlife Habitat Incentives Program (WHIP)	101,500	199,214	0	300,714
Biomass Research and Development	0	0	0	0

NEW MEXICO—Continued

[Fiscal Year 2003 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Conservation Technical Assistance	7,807,717	0	0	7,807,717
Plant Material Center (CO 46)	271,727	0	0	271,727
Snow Survey (CO 45)	132,975	0	0	132,975
Soil Survey (CO 02)	1,226,566	0	0	1,226,566
Flood Protection Operations (WF 03)	0	0	0	0
Watershed Rehabilitation (WF 07)	740,593	0	0	740,593
Small Watershed Operations (WF 08)	1,101,312	3,337,632	0	4,438,944
Emergency Watershed Protection	14,000	248,250	0	262,250
Watershed Planning (PL 06) ..	70,000	0	0	70,000
Forestry Incentive Program ...	0	0	0	0
Resource Conservation and Development (RC&D)	969,700	0	0	969,700
Total Obligation	16,710,927	21,051,994	0	37,762,922

NEW MEXICO

[Fiscal Year 2004 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0
Conservation Security Program (CSP)	121,311	586,330	0	707,641
Conservation Reserve Program (CRP)	22,300	0	0	22,300
Environmental Quality Incentives Program (EQIP)	5,391,301	21,042,028	0	26,433,329
Ground and Surface Water Conservation (GSWC)	237,576	1,039,399	0	1,276,975
Klamath Basin (KB)	0	0	0	0
Farm and Ranch Lands Protection Program (FRPP)	12,700	422,000	0	434,700
Grassland Reserve Program (GRP)	231,076	0	0	231,076
Wetland Reserve Program (WRP)	30,000	450,000	0	480,000
Wildlife Habitat Incentives Program (WHIP)	98,801	296,786	0	395,587
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance	8,588,150	0	0	8,588,150
Plant Material Center (CO 46)	304,397	0	0	304,397
Snow Survey (CO 45)	134,540	0	0	134,540
Soil Survey (CO 02)	1,094,010	0	0	1,094,010
Flood Protection Operations (WF 03)	0	0	0	0
Watershed Rehabilitation (WF 07)	986,805	0	0	986,805
Small Watershed Operations (WF 08)	489,943	94,814	0	584,757
Emergency Watershed Protection	195,779	0	0	195,779
Watershed Planning (PL 06) ..	24,334	0	0	24,334
Forestry Incentive Program ...	0	0	0	0
Resource Conservation and Development (RC&D)	1,140,873	0	0	1,140,873
Total Obligation	19,103,896	23,931,357	0	43,035,253

NEW MEXICO

[Fiscal Year 2005 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0
Conservation Security Program (CSP)	318,101	1,540,819	0	1,858,920
Conservation Reserve Program (CRP)	25,000	0	0	25,000
Environmental Quality Incentives Program (EQIP)	6,097,826	23,471,908	0	29,569,734
Ground and Surface Water Conservation (GSWC)	186,826	670,476	0	857,302
Klamath Basin (KB)	0	0	0	0
Farm and Ranch Lands Protection Program (FRPP)	22,833	657,647	0	680,480
Grassland Reserve Program (GRP)	175,000	0	0	175,000
Wetland Reserve Program (WRP)	9,260	200,000	0	209,360
Wildlife Habitat Incentives Program (WHIP)	52,931	237,984	0	290,915
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance	8,476,576	0	0	8,476,576
Plant Material Center (CO 46)	326,600	0	0	326,600
Snow Survey (CO 45)	158,841	0	0	158,841
Soil Survey (CO 02)	1,178,539	0	0	1,178,539
Flood Protection Operations (WF 03)	0	0	0	0
Watershed Rehabilitation (WF 07)	618,943	0	0	618,943
Small Watershed Operations (WF 08)	250,121	-183,493	0	66,627
Emergency Watershed Protection	5,818	0	0	5,818
Watershed Planning (PL 06) ..	77,800	0	0	77,800
Forestry Incentive Program ...	0	0	0	0
Resource Conservation and Development (RC&D)	1,025,234	0	0	1,025,234
Total Obligation	19,006,349	26,595,341	0	45,601,690

NEW MEXICO

[Fiscal Year 2006 Obligations (thru 1/25/06) in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0
Conservation Security Program (CSP)	219,929	1,545,900	0	1,765,829
Conservation Reserve Program (CRP)	75,400	0	0	75,400
Environmental Quality Incentives Program (EQIP)	5,678,277	18,233,198	0	23,911,475
Ground and Surface Water Conservation (GSWC)	296,647	1,036,116	0	1,332,763
Klamath Basin (KB)	0	0	0	0
Farm and Ranch Lands Protection Program (FRPP)	18,557	291,365	0	309,922
Grassland Reserve Program (GRP)	0	0	0	0
Wetland Reserve Program (WRP)	10,683	0	0	10,683
Wildlife Habitat Incentives Program (WHIP)	103,056	340,570	0	443,626

NEW MEXICO—Continued

[Fiscal Year 2006 Obligations (thru 1/25/06) in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance	8,061,944	0	0	8,061,944
Plant Material Center (CO 46)	318,611	0	0	318,611
Snow Survey (CO 45)	145,500	0	0	145,500
Soil Survey (CO 02)	1,070,000	0	0	1,070,000
Flood Protection Operations (WF 03)	0	0	0	0
Watershed Rehabilitation (WF 07)	608,000	1,830,000	0	2,438,000
Small Watershed Operations (WF 08)	234,000	1,485,200	0	1,719,200
Emergency Watershed Protection	0	0	0	0
Watershed Planning (PL 06) ..	72,188	0	0	72,188
Forestry Incentive Program ...	0	0	0	0
Resource Conservation and Development (RC&D)	979,469	0	0	979,469
Total Obligation	17,892,261	24,762,349	0	42,654,610

NATIONAL SUMMARY

[Fiscal Year 2001 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	1,497,000	6,714,711	0	8,211,711
Conservation Security Program (CSP)	0	0	0	0
Conservation Reserve Program (CRP)	23,072,600	0	0	23,072,600
Environmental Quality Incentives Program (EQIP)	37,867,332	159,299,075	1,809,775	198,976,182
Ground and Surface Water Conservation (GSWC)	0	0	0	0
Klamath Basin (KB) Farm and Ranch Lands Protection Program (FRPP) ...	700,000	16,799,950	0	17,499,950
Grassland Reserve Program (GRP)	0	0	0	0
Wetland Reserve Program (WRP)	13,959,500	140,532,931	0	154,492,431
Wildlife Habitat Incentives Program (WHIP)	2,371,355	12,695,065	0	15,066,420
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance ...	537,861,992	0	0	537,861,992
Plant Material Center (CO 46)	7,597,228	0	0	7,597,228
Snow Survey (CO 45)	3,658,458	0	0	3,658,458
Soil Survey (CO 02)	64,095,643	0	0	64,095,643
Flood Protection Operations (WF 03) ..	3,406,918	8,878,468	0	12,285,385

NATIONAL SUMMARY—Continued

[Fiscal Year 2001 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Watershed Rehabilitation (WF 07)	0	0	0	0
Small Watershed Operations (WF 08)	30,756,830	60,359,705	0	91,116,535
Emergency Watershed Protection	21,833,608	114,449,917	0	136,283,526
Watershed Planning (PL 06)	8,112,750	0	0	8,112,750
Forestry Incentive Program	0	9,936,787	0	9,936,787
Resource Conservation and Development (RC&D)	35,171,412	0	0	35,171,412
Alaska Villages Initiative	0	0	0	0
Total Obligation	791,962,626	529,666,610	1,809,775	1,323,439,011

NATIONAL SUMMARY

[Fiscal Year 2002 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	1,490,000	6,878,871	0	8,368,871
Conservation Security Program (CSP)	0	0	0	0
Conservation Reserve Program (CRP)	23,055,128	0	0	23,055,128
Environmental Quality Incentives Program (EQIP)	63,330,965	320,993,646	221,383	384,545,994
Ground and Surface Water Conservation (GSWC)	4,738,625	20,462,727	0	25,201,352
Klamath Basin (KB)	427,432	2,062,699	0	2,490,131
Farm and Ranch Lands Protection Program (FRPP) ...	28,800	50,677,000	0	50,705,800
Grassland Reserve Program (GRP)	0	0	0	0
Wetland Reserve Program (WRP)	2,366,050	263,703,509	0	266,069,558
Wildlife Habitat Incentives Program (WHIP)	2,719,682	14,384,414	0	17,104,097
Biomass Research and Development	0	0	0	0
Conservation Technical Assistance ...	580,904,071	0	0	580,904,071
Plant Material Center (CO 46)	8,393,160	0	0	8,393,160
Snow Survey (CO 45)	5,841,327	0	0	5,841,327
Soil Survey (CO 02)	66,922,576	0	0	66,922,576
Flood Protection Operations (WF 03) ..	3,133,535	15,338,022	0	18,471,557
Watershed Rehabilitation (WF 07)	5,857,526	3,300,000	0	9,157,526
Small Watershed Operations (WF 08)	36,047,855	54,642,691	0	90,690,546

NATIONAL SUMMARY—Continued

[Fiscal Year 2002 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Emergency Watershed Protection	11,926,815	68,677,266	0	80,604,082
Watershed Planning (PL 06)	10,475,973	0	0	10,475,973
Forestry Incentive Program	0	10,309,052	0	10,309,052
Resource Conservation and Development (RC&D)	43,240,399	2,500	0	43,242,899
Alaska Villages Initiative	0	0	0	0
Total Obligation	870,899,919	831,432,398	221,383	1,702,553,699

NATIONAL SUMMARY

[Fiscal Year 2003 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	1,062,700	0	0	1,062,700
Conservation Security Program (CSP)	5,890	0	0	5,890
Conservation Reserve Program (CRP)	24,800	0	0	24,800
Environmental Quality Incentives Program (EQIP)	40,459,693	0	0	40,459,693
Ground and Surface Water Conservation (GSWC)	135,078,328	505,913,750	0	640,992,078
Klamath Basin (KB)	7,963,426	40,066,315	0	48,029,741
Farm and Ranch Lands Protection Program (FRPP) ...	1,556,450	10,732,635	0	12,289,085
Grassland Reserve Program (GRP)	2,097,426	75,135,700	0	77,233,126
Wetland Reserve Program (WRP)	13,836,092	47,646,128	0	61,482,221
Wildlife Habitat Incentives Program (WHIP)	6,426,082	17,908,697	0	24,334,779
Biomass Research and Development)	0	0	0	0
Conservation Technical Assistance ...	597,517,430	0	0	597,517,430
Plant Material Center (CO 46)	9,100,650	0	0	9,100,650
Snow Survey (CO 45)	6,035,192	0	0	6,035,192
Soil Survey (CO 02)	72,818,528	0	0	72,818,528
Flood Protection Operations (WF 03) ..	4,835,545	7,455,094	0	12,290,639
Watershed Rehabilitation (WF 07)	15,370,237	12,611,750	0	27,981,987
Small Watershed Operations (WF 08)	34,056,765	70,590,756	0	104,647,520
Emergency Watershed Protection	13,133,668	56,335,473	0	69,469,140
Watershed Planning (PL 06)	9,552,083	0	0	9,552,083

NATIONAL SUMMARY—Continued

[Fiscal Year 2003 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Forestry Incentive Program	0	1,877,013	0	1,877,013
Resource Conservation and Development (RC&D)	45,319,984	0	0	45,319,984
Alaska Villages Initiative	0	0	0	0
Total Obligation	1,038,147,641	1,119,642,584	0	2,157,790,226

NATIONAL SUMMARY

[Fiscal Year 2004 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	2,899,610	10,271,519	0	13,171,129
Conservation Security Program (CSP)	4,621,341	34,556,220	0	39,177,561
Conservation Reserve Program (CRP)	51,534,719	0	0	51,534,719
Environmental Quality Incentives Program (EQIP)	175,268,893	673,390,604	0	848,659,497
Ground and Surface Water Conservation (GSWC)	12,271,436	50,156,163	0	62,427,599
Klamath Basin (KB) Farm and Ranch Lands Protection Program (FRPP) ...	2,388,940	88,087,544	0	90,476,484
Grassland Reserve Program (GRP)	10,212,519	31,638,559	0	41,851,078
Wetland Reserve Program (WRP)	25,278,205	257,783,609	0	283,061,814
Wildlife Habitat Incentives Program (WHIP)	8,625,086	27,927,615	0	36,552,701
Biomass Research and Development	0	5,727	0	5,727
Conservation Technical Assistance ...	634,827,792	0	0	634,827,792
Plant Material Center (CO 46)	10,512,916	0	0	10,512,916
Snow Survey (CO 45)	6,046,009	0	0	6,046,009
Soil Survey (CO 02)	67,735,270	0	0	67,735,270
Flood Protection Operations (WF 03) ..	4,448,992	7,574,375	0	12,023,367
Watershed Rehabilitation (WF 07)	14,609,727	12,999,350	0	27,609,077
Small Watershed Operations (WF 08)	27,683,965	55,711,626	0	83,395,591
Emergency Watershed Protection	7,258,622	41,370,730	0	48,629,352
Watershed Planning (PL 06)	8,472,303	0	0	8,472,303
Forestry Incentive Program	0	2,532,105	0	2,532,105
Resource Conservation and Development (RC&D)	49,755,726	0	0	49,755,726

NATIONAL SUMMARY—Continued

[Fiscal Year 2004 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Alaska Villages Initiative	0	0	0	0
Total Obligation	1,127,634,067	1,308,859,476	0	2,436,493,543

NATIONAL SUMMARY

[Fiscal Year 2005 Obligations in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	4,033,218	9,746,596	0	13,779,814
Conservation Security Program (CSP)	30,179,507	171,388,723	0	201,568,230
Conservation Reserve Program (CRP)	69,206,913	0	0	69,206,913
Environmental Quality Incentives Program (EQIP)	239,491,090	755,979,613	0	995,470,703
Ground and Surface Water Conservation (GSWC)	14,339,856	50,418,417	0	64,758,273
Klamath Basin (KB)	2,076,137	8,035,176	0	10,111,313
Farm and Ranch Lands Protection Program (FRPP) ...	4,933,959	106,853,750	0	111,787,709
Grassland Reserve Program (GRP)	13,661,297	13,311,523	0	26,972,820
Wetland Reserve Program (WRP)	27,024,791	223,897,622	0	250,922,413
Wildlife Habitat Incentives Program (WHIP)	11,229,549	34,360,524	0	45,590,073
Biomass Research and Development	208,023	350,000	0	558,023
Conservation Technical Assistance ...	756,354,418	0	0	756,354,418
Plant Material Center (CO 46)	13,310,649	0	0	13,310,649
Snow Survey (CO 45)	10,230,634	0	0	10,230,634
Soil Survey (CO 02)	89,241,053	0	0	89,241,053
Flood Protection Operations (WF 03) ..	4,417,677	4,812,692	0	9,230,369
Watershed Rehabilitation (WF 07)	15,284,977	12,533,651	0	27,818,628
Small Watershed Operations (WF 08)	32,344,446	39,057,379	0	71,401,825
Emergency Watershed Protection ...	27,380,335	266,974,525	0	294,354,860
Watershed Planning (PL 06)	6,844,867	0	0	6,844,867
Forestry Incentive Program	0	0	0	0
Resource Conservation and Development (RC&D)	51,997,906	0	0	51,997,906
Alaska Villages Initiative	0	496,000	0	496,000
Total Obligation	1,423,791,302	1,698,216,191	0	3,122,007,493

NATIONAL SUMMARY

[Fiscal Year 2006 Obligations (thru 1/25/06) in \$]

Program Name	Technical Assistance (TA)	Financial Assistance (FA)	Educational Assistance (EA)	Total
Agricultural Management Assistance (AMA)	0	0	0	0
Conservation Security Program (CSP)	25,650,890	174,803,470	0	200,454,360
Conservation Reserve Program (CRP)	14,573,262	0	0	14,573,262
Environmental Quality Incentives Program (EQIP)	236,140,190	727,135,464	0	963,275,654
Ground and Surface Water Conservation (GSWC)	18,652,336	50,489,996	0	69,142,332
Klamath Basin (KB) Farm and Ranch Lands Protection Program (FRPP) ...	3,133,834	8,037,000	0	11,170,834
Grassland Reserve Program (GRP)	3,193,888	68,954,992	0	72,148,880
Wetland Reserve Program (WRP)	0	0	0	0
Wildlife Habitat Incentives Program (WHIP)	22,949,833	199,750,000	0	222,699,833
Biomass Research and Development Conservation Technical Assistance ...	10,297,510	32,509,488	0	42,806,998
Plant Material Center (CO 46)	0	0	0	0
Snow Survey (CO 45)	682,551,758	0	0	682,551,758
Soil Survey (CO 02)	10,719,826	0	0	10,719,826
Flood Protection Operations (WF 03) ..	10,299,056	0	0	10,299,056
Watershed Rehabilitation (WF 07)	85,165,261	0	0	85,165,261
Small Watershed Operations (WF 08)	3,272,199	3,333,600	0	6,605,799
Emergency Watershed Protection	14,356,277	16,833,000	0	31,189,277
Watershed Planning (PL 06)	25,983,433	43,334,519	0	69,317,952
Forestry Incentive Program	12,228,883	40,358,994	0	52,587,877
Resource Conservation and Development (RC&D)	5,938,870	0	0	5,938,870
Alaska Villages Initiative	0	0	0	0
Total Obligation	50,707,515	0	0	50,707,515
	0	0	0	0
	1,235,814,821	1,365,540,523	0	2,601,355,344

The CHAIRMAN. Thank you very much, Mr. Secretary.

Now we're going to ask Mr. Otero, chairman of the Middle Rio Grande Conservancy District, to start, and whenever he is ready, he can yield to the expert that he has with him.

**STATEMENT OF JOSÉ U. OTERO, CHAIRMAN OF THE BOARD
OF DIRECTORS, MIDDLE RIO GRANDE CONSERVANCY
DISTRICT**

Mr. OTERO. Senator Domenici and Senator Bingaman, my name is José Otero. I'm the chairman of the board of directors of the Middle Rio Grande Conservancy District, and I have been chairman since June 2001. I want to thank you for the opportunity to bring you up to date on the progress the District has made to improve water management in the Middle Rio Grande Valley.

Senator Domenici asked me to be brief, and I intend to do that. You have a copy of my written report, and we have about 20 copies distributed around the room, with more detail on our work.

The CHAIRMAN. Right.

Mr. OTERO. I want to thank Representative Wilson for the good work she put in for the Conservancy District. In fact, I thought, at the time, she was quoting from my report to you.

[Laughter.]

Mr. OTERO. I want to introduce my board members that were able to make it: Mr. Bill Turner from Albuquerque, he represents the Albuquerque Division, and Mr. Jimmy Wagner, in the back, represents Sandoval County.

We have seven members representing their district. Our district stretches from Cochiti to the Bosque del Apache Refuge. It's 150 miles in length. We have about 1,500 miles of canals and ditches that we maintain to bring the water to the irrigators. The District encompasses about 277,000 acres, of which 62,000 currently are being irrigated. Our District serves over 11,000 Indian and non-Indian irrigators along 150 miles of the length of the Rio Grande.

Where I farm, in Valencia County, the District has been an important voice for agriculture since its inception in 1925. It's also the same with all the other counties—Sandoval, Bernalillo, and Socorro. We have had great success working with the Bureau of Reclamation, the New Mexico Interstate Stream Commission, and other partners to modernize all of the District's important infrastructure.

Along with the very valuable support we have received from Senator Domenici, the Bureau of Reclamation Water 2025 Program has been a great help to our staff. Senator Domenici, through your diligent efforts to secure the funding necessary to carry on this work, we have been able to show our serious commitment to improving water management while we continue to support agriculture for both Indian and non-Indian alike.

With the advent of the Water 2025 Program, through your diligent efforts to secure the funding necessary to carry on this work, which we greatly appreciate, we have achieved the pace of promise. We have accelerated the pace of progress. To date, we have installed 56 new and upgraded 14 old gauges to measure water flows in our irrigation water delivery system. Forty-three automated water control gates have been installed, and 18 weather stations have been built which serve to calculate the consumptive water needs of both crops and riparian vegetation. These measurement and control devices, in conjunction with the District's institution of strict scheduling and rotation of the water deliveries, have produced a major water savings for the region. The Federal and State

water managers and other interested parties have been utilizing data from our state-of-the-art metering and measuring devices available on our web site to make better-informed decisions.

I would be remiss in not complimenting the irrigators themselves. They have spent loads of money to put concrete-lined ditches in their fields, and this has also helped to increase the savings of water.

Many other irrigation system improvement projects are under construction or planned, and of the \$2.5 million the Water 2025 funds have provided to the District to date, approximately \$600,000 has been spent or obligated. The District's required 50 percent cost share is being met and the work is on target to be completed by December 2008. I am very proud of the progress made by the District, and I look forward to continuing to work with the concerned departments and Congress to complete the improvements that are planned and under construction, as far as the 2025 project.

Thank you, Mr. Domenici, for your support of our important work. We appreciate it.

The CHAIRMAN. Thank you, Mr. Chairman. Did you want Mr. Grogan to speak now?

Mr. GROGAN. Senator, I'd be happy to yield, in the interests of time, and make myself available for questions.

[The prepared statement of Mr. Otero follows:]

PREPARED STATEMENT OF JOSÉ U. OTERO, CHAIRMAN OF THE BOARD OF DIRECTORS,
MIDDLE RIO GRANDE CONSERVANCY DISTRICT

Thank you for this opportunity to report to you on the progress the Middle Rio Grande Conservancy District has made during the current drought to improve water management, support agriculture, and protect endangered species in the middle Rio Grande valley.

The District provides irrigation water, drainage, and flood control services to some eleven thousand Indian and non-Indian irrigators, and many communities, including Albuquerque, along 150 miles of the Rio Grande between the outlet of Cochiti Dam and the northern boundary of Bosque del Apache National Wildlife Refuge. The District encompasses some 277,000 acres, of which approximately 62,000 acres are currently being irrigated. More than \$30 million in economic activity is generated annually by irrigated agriculture in the District.

In 2005, some 366,000 acre feet of water were diverted by the District from the Rio Grande, amounting to approximately 5.9 acre-feet per irrigated acre. Of that amount, approximately 155,000 acre-feet was consumed by crops, 146,000 acre-feet was returned to the river through surface and subsurface flows, and approximately 65,000 acre-feet was consumed by riparian vegetation and open water evaporation. The improvements outlined in this report have allowed us to reduce District diversions of water from the Rio Grande by 39% since 1994, thus conserving this precious resource and making water available for endangered species and other uses.

Since 1995, we have had great success working with the Bureau of Reclamation, the New Mexico Interstate Stream Commission, the Middle Rio Grande Endangered Species Collaborative Program, and others, to improve the efficiency of our irrigation system, create new habitat for endangered species, and upgrade our water management in concert with the social, economic, and environmental values of this watershed.

With the advent of the Water 2025 Program, and though the diligent efforts of Senators Domenici and Bingaman to secure the funding necessary to carry on this work, which we greatly appreciate, we have accelerated the pace of progress. To date, the District has installed 56 new gages and upgraded 14 old gages to measure water flows in our irrigation water delivery system. Forty three automated water control gates have been installed, and 18 weather stations have been installed to calculate consumptive water needs of both crops and riparian vegetation. These measurement and control devices, in conjunction with the District's institution of strict scheduling and rotation of water deliveries, have produced major water savings for the region. The Federal and State water managers, along with other inter-

ested parties, have been utilizing the data from the District's state-of-the-art metering and measuring devices available on our website to make better-informed decisions.

Many other irrigation system improvement projects are under construction or planned. Of the \$2.5 million in Water 2025 funds provided to the District's to date, approximately \$600,000 has been spent or obligated, the District's required 50% cost share is being met, and the work is on-target to be completed by December, 2008.

To support protection and recovery of the endangered Rio Grande silvery minnow and the southwestern willow flycatcher, the District has for several years taken specific steps to improve our management of water, including a guarantee of certain minimum flows below the Isleta and San Acacia diversion dams. These minimum flows are planned and managed in conjunction with Reclamation to meet minimum flow targets of the Biological Opinion. Occasionally, Reclamation runs short of water, and the District has consistently covered those shortfalls by providing irrigation return flow water until the water released by Reclamation arrives. The District will continue these and other operations as long as necessary to avoid jeopardizing the Biological Opinion and helping Reclamation to conserve the supply of supplemental water for endangered species.

In 2006, as in the past few years, the District has carefully monitored and controlled our start-up and early season operations to minimize the impact on the Rio Grande. The annual startup process is now staggered so that only one Division at a time takes water, waiting until that water travels through the canal system and returns to the river before starting-up the next Division. These actions allowed Reclamation to defer releasing any of the stored silvery minnow water until nearly the end of March this year.

In spite of the ongoing drought, the District is planning for the 2006 season to be one of normal water deliveries based upon several conservation measures that are already in place. Diversions are tightly monitored and controlled to make the most of a limited water supply. That allows the District's stored water to last longer and also allows Reclamation to minimize releases of water stored for the silvery minnow. Return flows in excess of District needs are provided at key points and combined with the minnow water from Reclamation. These and other management strategies have allowed the District, working closely with Reclamation and others, to maintain compliance with the Biological Opinion flow targets while conserving precious stored water.

As we continue to carefully monitor agricultural demand, diversions, river flows, and riparian consumption, we had until last week provided as much as 100% of the target flow at the San Acacia diversion. Now, our conservation measures are allowing us to save as much as 100 to 150 acre-feet per day of the water stored for the silvery minnow.

The automatic water control gates we have installed at the Isleta and San Acacia diversion dams make a huge contribution to the District's water conservation program. As we are now able to maintain the Biological Opinion target flows with greater precision, we can more rigorously conserve the water stored for the silvery minnow. For example, when the target flow is 150 cubic feet per second, that target can now be consistently met within about 3%, thus avoiding the large daily oscillations that used to cause the river to dry and re-wet, stranding many fish. This improvement has, however, come at some cost to the District, as our canals now endure a daily fluctuation in flows that makes irrigation scheduling more complicated.

Under the District's current water delivery criteria, irrigators receive water approximately every two or three weeks, depending upon the crop they are growing and other factors. In managing through the current drought, the District has had to make difficult decisions that have not always pleased all of our constituents. Nevertheless, to date we have been able to minimize the drought-related damage to irrigators.

In light of the water storage restrictions of Article VII. of the Rio Grande Compact, we predict that we will end this irrigation season with little or no water in storage at El Vado Reservoir. In that case, the 2007 irrigation season is likely to be significantly more difficult for all irrigators.

In spite of the drought, the progress made by the District, with your crucial support and the help of our partners, has allowed us to continue our historic mission of providing irrigation, drainage, and river flood control to support and sustain agriculture, even as we improve water management and support the recovery of endangered species. The District is committed to continuing to do all we can to meet the flow targets of the Biological Opinion even as we refine and improve upon our accomplishments in the areas of water conservation and improved water management. Thank you for your support of these important efforts.

The District extends to all members of the Committee and staff an open invitation to come visit us to see how much progress we have made and the nature of the challenges still ahead.

The CHAIRMAN. OK. Very good.

We're going to now move to Mr. D'Antonio. Thank you again for your patience in waiting. I know you have a lot of things to do in your office.

**STATEMENT OF JOHN D'ANTONIO, NEW MEXICO
STATE ENGINEER**

Mr. D'ANTONIO. Thank you, Mr. Chairman, Mr. Bingaman. Thank you for holding this hearing in New Mexico—it's great to have both of you here—and your influence not only with the State, but within the Nation and the benefits it brings to the State of New Mexico. I also want to really thank you for your staffs. You have great staffs. Nate Gentry, Eric Webb, Callie Gibson, helping us in the State; and Mike Connor with your staff, Senator Bingaman. They're invaluable to help us with our water issues within the State of New Mexico.

Today I'm going to talk about drought and the effects it has on some of the critical water issues confronting the State of New Mexico. Obviously, we've talked about the driest winter in the last 112 years, snowpack conditions being very poor, poor since 1950. The drought conditions in the near future are not likely to abate, and may worsen. Governor Richardson issued an executive order this year, on March 14, with an official drought declaration for the State of New Mexico.

One of our significant issues is the delivery of surface water to irrigation districts in the Lower Rio Grande. As you know, 6 years ago, Texas threatened to sue New Mexico and claimed groundwater diversions were interfering with the Rio Grande project water deliveries to El Paso Irrigation and Water Conservation District No. 1. To date, Texas has not followed through with that litigation, and New Mexico has had numerous discussions with Texas concerning the State engineer's historic administration of water rights, which has not affected project deliveries, and that improved efforts are being undertaken to ensure such deliveries continue unimpeded.

However, drought coupled with the rate of development during the last 30 years has illuminated areas in need of attention, as the great margin of error once enjoyed by New Mexico has evaporated, and is now razor-thin. In order to ensure our State utilizes its full entitlement and maximizes the beneficial use of its available water supply, we have undertaken major administrative changes. I have ordered metering and groundwater diversions in the Lower Rio Grande below Elephant Butte Dam. We also are developing a more advanced water rights application analysis process to complement the completion of one of the most advanced models in the country for the conjunctive management of surface and groundwater sources, which requires the acquisition of new and improved technology.

The Department of the Interior's Water 2025 initiative focuses, in part, on avoiding crises associated with western water management issues. Water 2025, a problem-solving initiative, helps States such as New Mexico develop and implement strategies and put

proper tools in place to better manage the scarce resources that we have. This partnership will help nourish a healthy environment and sustain a vibrant economy by fostering cooperation and collaboration between all water users, especially during times of drought.

The process of acquiring, developing, and implementing these tools is part of my active water resource management plan. Implementation of this initiative in the Lower Rio Grande will benefit the United States because the Bureau of Reclamation is actively contributing to and participating in the implementation of this initiative to promote the project's efficient operation. Texas' project members will benefit from Reclamation's increased efficiency in delivering project water and New Mexico's active management of this water resources.

New Mexicans benefit by avoiding costly litigation, and they will continue to maximize beneficial use of available water supply. The New Mexico Interstate Stream Commission will benefit from approximately \$1 million in funds through the Bureau of Reclamation's Water 2025 grant program for work related to the design and construction of the Seven Rivers augmentation wellfield pipeline project down in the Pecos River Basin. The pipeline will deliver water from the Seven Rivers augmentation wellfield to Brantley Reservoir. This completed wellfield and pipeline will satisfy one of the conditions of the settlement agreement and will help the Interstate Stream Commission comply with the Pecos River Compact.

Also, the Interstate Stream Commission received a Water 2025 Challenge Grant for close to \$60,000 to be used to rehabilitate the USGS streamflow gauge in the Pecos River at Red Bluff to provide more accurate high-streamflow measurements and improve site accessibility during high flow conditions. The Red Bluff gauge is the index station for measuring flows delivered to Texas under the Pecos River Compact. Again, that accentuates the importance of the accuracy of the flow measurements at this location.

The State of New Mexico very much appreciates the funding that may be available to New Mexico under S. 178, the New Mexico Water Planning Assistance Act, through the Senate, and we hope that the bill will pass through the House and be acceptable to the President for signing into law. This bill is especially important because it makes funds available to begin implementation of important measuring and metering projects in the Lower Rio Grande, in addition to other areas of New Mexico.

The drought has also highlighted areas of the State in need of urgent assistance from maximizing the available water supply. That includes funding for maintenance and improvements to interstate and intrastate stream gauging programs and metering initiatives; the construction of a pipeline in the Fort Sumner area to deliver water to the Pecos River to assist the Federal Government in meeting flow requirements for the benefit of the endangered Pecos bluntnose shiner; improved irrigation efficiency for Indian tribes and acequias; the hydrologic and biological studies to implement the New Mexico portions of the 2004 Arizona Water Rights Settlement Act in the Gila and San Francisco Basins; and the development of hydrologic data, groundwater characterization data base development, and data distribution relating to the salt basin.

Development of desalination projects is important also, and passage of legislation through Congress enacting the Taos Navajo and Aamodt water rights settlements. Most recently, on March 31, there was a public release of the Taos Pueblo Water Rights Draft Settlement Agreement, and that joint public release is an important first step toward completing a water rights settlement in the Taos Valley.

We also have the Navajo Nation Water Rights Settlement that's important because it would resolve the claims of the Navajo Nation for use of the waters in the San Juan River Basin in Northwestern New Mexico, and also the Aamodt Settlement, which is four decades of litigation adjudicating water rights for the Pueblos of Nambe, Pojoaque, Tesuque, and San Ildefonso and use of the waters of the Rio Pojoaque in north-central New Mexico.

With that, Mr. Chairman and Senator Bingaman, I conclude my report.

[The prepared statement of Mr. D'Antonio follows:]

PREPARED STATEMENT OF JOHN D'ANTONIO, NEW MEXICO STATE ENGINEER

Thank you for allowing me to speak today . . . about drought and the effect it has on some critical water issues confronting the State of New Mexico. New Mexico is currently suffering through one of the driest winters in the last 112 years, and in parts of the state, this is the driest year in recorded history. New Mexico's rivers and streams are expected to have extremely low flows because the snowpack conditions are the poorest since 1950. Also, the National Weather Service is predicting that dry conditions will continue throughout most of New Mexico for the remainder of the spring season. Drought conditions, in the near future, are not likely to abate and may worsen. Governor Bill Richardson issued Executive Order 2006-012 on March 14, 2006, with an official drought declaration for the State.

One of our significant issues is the delivery of surface water to irrigation districts in the Lower Rio Grande. As you know, six years ago Texas threatened to sue New Mexico . . . and claimed groundwater diversions were interfering with Rio Grande Project water deliveries to El Paso Irrigation and Water Conservation District Number One. To date . . . Texas has not followed through with litigation. New Mexico has had numerous discussions with Texas . . . concerning the State Engineer's historic administration of water rights . . . which has not affected project deliveries and that improved efforts are being undertaken to ensure such deliveries continue unimpeded.

However, drought . . . coupled with the rate of development during the last 30 years . . . has illuminated areas in need of attention as the great margin of error once enjoyed by New Mexico has evaporated . . . and is now razor thin. In order to ensure our state utilizes its full entitlement and maximizes the beneficial use of its available water supply, we are undertaking major administrative changes. I have ordered metering of groundwater diversions in the Lower Rio Grande below Elephant Butte Dam. We are developing a more advanced water rights application analysis process to complement the completion of one of the most advanced models in the country for the conjunctive management of surface and groundwater sources . . . which requires the acquisition of new and improved technology.

The Department of the Interior's Water 2025 initiative focuses in part on avoiding crisis associated with western water management issues. Water 2025—a problem-solving initiative helps states such as New Mexico develop and implement strategies and put proper tools in place to better manage scarce water resources. This partnership will help nourish a healthy environment and sustain a vibrant economy by fostering cooperation and collaboration between all water users, especially during times of drought. The process of acquiring . . . developing . . . and implementing these tools is part of my *Active Water Resource Management* plan. Implementation of this initiative in the Lower Rio Grande will benefit the United States . . . because the Bureau of Reclamation is actively contributing to and participating in the implementation of this initiative to promote the project's efficient operation. Texas' Project members will benefit from Reclamation's increased efficiency in delivering Project Water and New Mexico's active management of its water resources. New Mexicans benefit by avoiding costly litigation, and they will continue to maximize beneficial use of available water supply.

The New Mexico Interstate Stream Commission will benefit from approximately \$1 million in funds through the Bureau of Reclamation's Water 2025 grant program for work related to the design and construction of the Seven Rivers augmentation well field pipeline project. The pipeline will deliver water from the Seven Rivers augmentation well field to Brantley Reservoir. The completed well field and pipeline will satisfy one of the conditions of the Settlement Agreement and will help the Interstate Stream Commission comply with the Pecos River Compact.

The Interstate Stream Commission also received a Water 2025 Challenge Grant for close to \$60,000 of funding to be used to rehabilitate the USGS streamflow gage on the Pecos River at Red Bluff to provide more accurate high streamflow measurements and improve site accessibility during high flow conditions. The Red Bluff gage is the index station for measuring flows delivered to Texas under the Pecos River Compact, which accentuate the importance of accurate flow measurements at this location to New Mexico State.

The State of New Mexico very much appreciates the funding that may be available to New Mexico under Senate Bill 178 . . . the New Mexico Water Planning Assistance Act . . . through the Senate and we hope the bill will pass through the House and be acceptable to the President for signing into law. This bill is especially important because it makes funds available to begin implementation of important measuring and metering projects in the Lower Rio Grande in addition to other areas of New Mexico.

The drought has also highlighted areas in the state in need of urgent assistance to maximize the available water supply including:

- Funding for maintenance and improvement to interstate and intrastate stream gauging programs and metering initiatives
- Construction of a pipeline in the Fort Sumner area . . . to deliver water to the Pecos River to assist the federal government in meeting flow requirements for benefit of the Pecos Bluntnose Shiner
- Improved irrigation efficiency for Indian tribes and acequias
- Hydrological and biological studies to implement the New Mexico portions of the 2004 Arizona Water Settlement Act . . . in the Gila and San Francisco Basins
- Development of hydrologic data . . . groundwater characterization . . . database development and data distribution relating to the Salt Basin
- Development of desalination projects
- Passage of legislation through Congress enacting the Taos, Navajo, and Aamodt water right settlements.
- Most recently on March 31st . . . there was a public release of the Taos Pueblo Water Rights Draft Settlement Agreement. The agreement was reached through multi-party negotiations among the Taos Pueblo . . . the State of New Mexico . . . the Taos Valley Acequia Association . . . the Town of Taos . . . El Prado Water and Sanitation District . . . and 12 Taos-area Mutual Domestic Water Consumer Associations. The joint public release is an important first step toward completing a water rights settlement in the Taos Valley.
- The Navajo Nation Water Rights Settlement is also important because it would resolve the claims of the Navajo Nation for use of waters of the San Juan River Basin in northwestern New Mexico.
- The Aamodt Settlement . . . is important because it resolves nearly four decades of litigation by adjudicating the water rights of the Pueblos of Nambe . . . Pojoaque . . . Tesuque . . . and San Ildefonso to the use of the waters of the Rio Pojoaque in northcentral New Mexico.

The CHAIRMAN. Thank you very much.
Our last witness, Mr. Hightower.

**STATEMENT OF MICHAEL HIGHTOWER, DISTINGUISHED
MEMBER OF THE TECHNICAL STAFF, SANDIA NATIONAL
LABORATORIES, ALBUQUERQUE, NM**

Mr. HIGHTOWER. You know, it's tough sitting next to the State engineer in the time of drought. Everybody throws things at him, and if they miss, they're going to hit Sterling and myself.

[Laughter.]

Mr. HIGHTOWER. So I'm a little bit gun shy, but I'm going to try to get through this as quickly as I can.

Thank you, Senator Domenici and Senator Bingaman, for the opportunity to address you today about the research activities at Sandia National Laboratories and their applications to the State of New Mexico.

New Mexico is no stranger to drought. An old saying we have is that New Mexico has three types of weather: We are either in a drought, going into a drought, or coming out of a drought. And actually, that's not that far from true. Data from the National Drought Center suggests that over the last century, New Mexico has experienced either a severe or an extended drought for 1 year in 7.

The problem in arid regions like New Mexico is that we're becoming increasingly less resilient to drought. This is due to a combination of explosive growth, decreasing surface water runoff, and dropping groundwater tables. The drought concerns of today may be indicative of the kinds of persistent water shortages that we could find ourselves in on a regular basis in the future unless we develop a long-term strategy to reduce water consumption and improve water supplies and water management.

While we know we have limitations on our fresh water resources in New Mexico, there are opportunities to create new water. This is a major research direction at Sandia, and our efforts to create new water are focused in three areas.

First, we're conducting advanced water treatment research, trying to reduce the cost of using nonpotable water supplies to supplement fresh water supplies. The second area that we're working on is advanced water conservation research to try to reduce fresh water use and fresh water demands. And the third area that we're working on is the development of innovative decision support tools and modeling tools to try to improve overall water management.

To support these efforts, we are actively partnering with industry, government agencies, and research institutions in New Mexico—and, most importantly, communities in New Mexico—to develop and test technologies that address user needs. This approach has helped us gain acceptance of new technologies and accelerate their use both in New Mexico and internationally and nationally, as well. Our research partnerships have included both near-term support for New Mexico communities, as well as development of capabilities to build a foundation for sustained improvements in water availability and quality.

A couple of our major efforts in the State include partnering with the State engineer, the city of Alamogordo, Federal water agencies like the Bureau of Reclamation and USGS, and New Mexico State University Water Resources Research Institute, to establish the National Inland Desalination Research Center in Alamogordo. This facility is funded by Congress—by you, Senator—and is completing construction. We've already done some preliminary testing on technologies. One of those technologies was recently used to support Katrina relief efforts and provided over 200,000 gallons a day of treated water for emergency drinking water supplies in Mississippi. That system is being moved to Gallup to look at research on desalination of brackish water in the Gallup area, which is very important in the State of New Mexico.

We are also conducting desalination and water research and providing technical assistance to a number of counties within the State, and have provided assistance to communities in Lea County, Sandoval County, Eddy County, Otero County, Chaves County, Lincoln County, Sierra County, and Bernalillo County.

The CHAIRMAN. What are you doing in those counties?

Mr. HIGHTOWER. Most of those counties are asking for information on costs of desalination, costs of treatment, disposal options, water resources, associated brackish water resources in those communities, in those counties.

We're also partnering with the oil and gas industry in the Permian, San Juan, and Raton Basins of New Mexico, as well as with organizations in Wyoming and Montana to conduct research on treatment and use of oil-field-produced water. In New Mexico, we produce almost 25 billion gallons of produced water a year in oil and gas production, and if we use just even a minor or a moderate amount of that, we can significantly impact fresh water supplies and water availability in some of those local areas. We're doing that activity in conjunction with New Mexico Tech, New Mexico State, UNM, Los Alamos National Laboratories, and local resource management agencies.

Also, in the treatment research area, we're evaluating new technologies to meet emerging treatment standards, such as arsenic, and some of the other 20 or 30 new standards that may be developed over the next several years. Our arsenic research efforts include local and national outreach programs to work with communities.

We're also conducting efforts on technology pilot testing in communities in New Mexico, including Anthony, Socorro, Rio Rancho, and Jemez Pueblo. And we have assisted over 75 New Mexico communities in assessing their water quality and identifying arsenic treatment technologies for their communities.

In an effort with the Department of Energy, Los Alamos and Sandia and other national laboratories are working with the Utton Center at UNM in developing a national technology road map to assess research needed associated with the consumption of fresh water use in the energy sector, which looms as a future major competing demand for water supplies.

Finally, in the water management area, Sandia is partnering with communities, government agencies, and stakeholders in the Middle Rio Grande to develop interactive water management decision support tools to help communities and agencies assess and manage options and evaluate long-term impacts of different water management options. Based upon the success of that modeling activity, we're developing similar tools to do cooperative water management with communities along the Gila River in New Mexico, the Willamette River in Oregon, and the Jordan River in Jordan.

In closing, Sandia's water research efforts emphasize the development of innovative approaches and technologies that support the wise use of water resources and that create new water. We continue to use local partnerships to help accelerate technology implementation. Our goal is to conduct research and development that supports long-term strategies to reduce future water shortages.

Thank you for the opportunity to address you today.

[The prepared statement of Mr. Hightower follows:]

PREPARED STATEMENT OF MICHAEL HIGHTOWER, DISTINGUISHED MEMBER OF THE
TECHNICAL STAFF, SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

RESEARCH, DEVELOPMENT, AND TECHNOLOGY TRANSFER EFFORTS AT SANDIA NATIONAL
LABORATORIES TO IMPROVE WATER RESOURCE AVAILABILITY

An old saying among water managers and water users in New Mexico is that “In New Mexico if we are not in a drought, then we are either coming out of a drought, or about to go into a drought.”

While that statement is often said facetiously, the saying fairly well represents New Mexico’s water supply dilemma. Like states in the High Plains and most of the western United States, New Mexico has been in either a severe or extreme drought for 10% to 15% of the time over the past century, or about one in seven years (Figure 1*). While we all pray for both snow and rain to get us out of the current multi-year drought :probably the worst we have seen in fifty years—we know that if it does rain again in New Mexico, drought conditions will return in three to seven years.

Because of our arid climate and frequency of drought, New Mexicans know well the economic and social tragedies that have accompanied extreme and extended droughts. New Mexicans have a long history of water planning and management to conserve fresh water resources during droughts. The ancient Indian cultures, the Pueblo Indians, and European immigrants all utilized dams and diversions to help capture, store, and transport water for irrigation and domestic uses to extend supplies during low flows. Drought was suggested as a major challenge to the pre-historic Anasazi and cliff dwelling cultures, and drought was the direct cause of the mass exodus and migration of farmers and ranchers out of the Southwest during the Dust Bowl of the 1930s.

The current extended drought is probably the most severe since 1950. New Mexico and many states across the country have become much less resilient to droughts because of emerging trends in climate variability, population and industrial growth, environmental and ecological water demands for endangered aquatic species, and over pumping of ground water for municipal and agricultural demands. As a result of these important trends of increasing water demand and reduced water availability, future extended droughts could have even more serious consequences than those in the past. For example, current climate trends suggest that New Mexico and states in the coastal and mountain West will experience significantly less winter snowfall and spring runoff in coming decades. Low snowpacks are expected to reduce future surface water runoff by as much as 10% to 15% each year, significantly reducing the quantity of water that will be stored in traditional reservoirs for use during droughts.

The long-term reduction in surface water availability will occur at a time when New Mexico’s population has grown from less than one million during the severe drought of the 1950s to a population of more than 1.8 million in 2005 and a projected population of 2.5 million by 2025. During the current drought, New Mexico is providing water to twice the population it did in the last major drought of 1950, and in the next major drought, New Mexico will have to provide water to almost two million more people than was required during the 1950s drought, while also trying to meet the water needed for increasing ecological, energy, industrial, and agricultural demands. Ground water from wells has been a major water supply resource that has helped limit the impacts and severity of past droughts. Unfortunately, in many places, our current ground water pumping practices have been unsustainable, and the amount of ground water available has declined significantly. This will limit our ability to use ground water to mitigate water supply shortages during future droughts.

These trends are not just a New Mexico problem, many other western states are projecting similar population growth and face similar water demand and supply challenges. Some arid states are projecting even double the growth rate in New Mexico. Therefore, competition over water resources among different water-use sectors and between states will become increasingly intense, especially during droughts. For these reasons, our traditional water-management and water-use practices and technologies might not be able to provide New Mexico or other states with the ability to cope with future extended droughts.

The potential shortfall in water resources has great potential to lead to negative long-term social and economic impacts to arid and drought-prone states like New

*All figures have been retained in committee files.

Mexico. Therefore, while it is important to help communities deal with the water-supply and water-resource issues during the current drought, we must also develop an improved, long-term approach and long-range strategy to ensure adequate fresh water supplies so that states, such as New Mexico, can meet future water needs in a sustainable manner, even during extended periods of drought.

As shown in Figure 2, the southwestern United States/northern Mexico region is one of the more water-stressed areas of the world. Worldwide, water has become a regional and global public health and economic concern with public safety, economic development, and national security implications. New Mexico's water issues, economic growth and development trends, and climate issues are similar to those in many regions of the world experiencing water stress or water shortages. Because of these similarities, Sandia believes New Mexico is an excellent "testbed" for national and international research, development, and demonstration programs that can implement new technologies to reduce fresh water demands, conserve and better manage fresh water supplies, and accelerate the use of impaired waters in arid urban and rural areas.

Using New Mexico as a "testbed" is an important element of Sandia National Laboratories' water research and development efforts to improve availability, reduce fresh water use, and improve water management and use. Our approach is to partner and collaborate with government agencies, industry, and academia and to work closely with local communities and municipalities to help demonstrate, evaluate, and implement new technologies. Partnering and collaboration are an effective technology transfer approach that when driven by the needs of water users encourages acceptance and implementation of innovative technologies that can improve water supplies and meet the cost and performance needs and expectations of communities and industry.

While the availability of fresh-water resources in New Mexico and the arid West may seem limited based on the current trends, there are significant opportunities to "create new water" through focused research and development. Carrying out this work in partnership with communities, industry, government agencies, and research institutions will play an important role in transferring technology and accelerating broad technology implementation. Sandia is working to "create new water" in three major areas:

- Advanced treatment to enhance the cost-effective use of nontraditional or non-potable water resources,
- Enhanced water conservation approaches to reduce fresh water demands, and
- Innovative decision support and modeling tools to improve water management.

A focus of Sandia's work is to support the use and management of water in a more sustainable manner, helping to reduce conflicts that will arise over limited water resources, especially during periods of water shortage, such as extended and extreme droughts.

Our research and development efforts in advanced treatment focus on technologies for cost-effective treatment of nontraditional or non-potable water resources to enhance their potential to be used to supplement fresh water resources. These research and development efforts include treatment of nontraditional water resources such as brackish water, produced water from oil and gas production, and waste water reuse and utilization. Additionally, we are working to develop advanced treatment approaches to address emerging contaminants such as arsenic, trace metals, and pharmaceuticals to maintain the use of these water resources.

In the water treatment research and development arena, Sandia is pursuing the following activities:

- *Long- and short-term research that will provide new water through advances in desalination of brackish water.*

This includes partnering with the State Engineer, the City of Alamogordo, federal water agencies, and New Mexico State University to establish and construct a National Inland Desalination Research Center in Alamogordo, providing a world-class desalination research and demonstration facility to help accelerate the evaluation and implementation of innovative and emerging desalination technologies for brackish ground water. The facility is completing construction, and well fields, water storage facilities, large-system outdoor testing areas, and evaporation ponds are already completed and operational. The indoor testing areas and laboratory and office facilities are being constructed. The facility is in initial operation and has already been used to evaluate a new, large Navy desalination system. Based on the performance data collected at this facility, the system was mobilized to provide emergency water purification of more than 200,000 gallons per day of

brackish water to critical facilities along the Gulf Coast in the aftermath of Hurricane Katrina.

Future research priorities for national desalination research are being established with user communities to support both urban and rural inland communities in the development of new technologies to utilize brackish water to supplement fresh water supplies. New technologies are being developed and tested in the laboratory with follow-on pilot testing scheduled at the National Inland Desalination Research Center and other desalination research centers.

Efforts have also included joint research on desalination and water reuse efforts with Rio Rancho and Alamogordo, and technical assistance on desalination extended to several New Mexico counties and communities.

- *Technical assistance and joint research is being conducted with industry and resource management groups on the treatment and use of produced water.*

This includes efforts in the Permian, San Juan, and Raton basins of New Mexico to investigate treating oil and gas produced water for cost-effective industrial and agricultural applications, reducing fresh water demands. Produced water is a potential water resource in New Mexico and many other states. For every barrel of oil produced, there are often 7 to 10 barrels of brackish water produced. Significant quantities of brackish water are also produced in conventional and coal-bed natural gas production. For example, New Mexico oil and gas production generates more than 25 billion gallons of produced water each year. Treatment and use of even a moderate percentage of these waters could help reduce fresh water demands. Our ongoing work in this area includes coordinating technical workshops in New Mexico and nationally on produced water and laboratory and field testing of emerging treatment technologies.

Current efforts include field testing projects in both the San Juan and Permian basins of New Mexico and technical assistance to the Department of Energy on coal-bed natural gas produced water treatment and utilization in Wyoming and Montana. These efforts have involved collaboration with New Mexico State University, New Mexico Tech, the University of New Mexico, Los Alamos National Laboratory, and resource management agencies in New Mexico and other states.

- *Cooperative research is being conducted with local communities to improve the cost and performance of new treatment technologies to meet emerging treatment standards, such as for arsenic.*

Our arsenic research efforts have included coordination of local and national outreach programs for communities on arsenic treatment costs and issues, providing laboratory analysis capabilities to local communities on arsenic content, and collaboration with local communities on arsenic technology demonstrations. We have conducted pilot demonstrations in New Mexico with Anthony, Socorro, Rio Rancho, and soon Jemez Pueblo on arsenic removal, and we have assisted over 75 New Mexico communities in testing and evaluating their water chemistry to help them understand their arsenic removal technology alternatives.

Sandia's ongoing efforts in water management and water conservation focus on development of approaches, technologies, and tools to improve the understanding, cooperation, and collaboration on water management and water conservation options and decisions. These efforts include advanced, science-based research of environmental and ecological water demands to help improve river and watershed management. Our efforts also include development of advanced decision-support tools and models for improved surface and ground water management, as well as regional water planning.

In the watershed management, water conservation, and the water management research and development arenas, Sandia is pursuing the following activities:

- *Coordinating with local communities the research to quantify environmental and ecological water demands.*

Efforts have included research on the water demands of endangered species on the Pecos River. These efforts helped identify the necessary flow regimes to support spawning of the Blunt Nosed Shiner, providing irrigators and wildlife agencies with information to effectively optimize water delivery operations to meet competing demands.

Research and development of real-time sensors has now created the ability to assess intermittent stream water flows and sediment quantities. The use of these sensors could provide information on water inflows to support improved water balance analyses and water management decisions, and help

to assess sedimentation rates to improve reservoir management and water storage ability.

Research is underway to quantify the impact of tamarisk removal on water availability and reservoir sedimentation. This work will help optimize tamarisk removal and river vegetation restoration to improve long-term water availability without increasing reservoir sedimentation, which could reduce overall water storage ability.

- *Sandia is coordinating the development of a national research roadmap for the Department of Energy to reduce water use in the energy sector.*

In this effort, Sandia is coordinating development of a national research roadmap to identify future research and development priorities that can reduce the use and consumption of fresh water in energy production and generation. Currently, electric power generation is the largest fresh water withdrawal sector in the country. While not all of the water withdrawn is consumed, increasing energy needs to meet population and economic growth, new environmental regulations, and efforts to transition to biofuels for transportation will significantly increase future water demands and water consumption by the energy sector, doubling or even tripling water needs. This increased demand will be further exacerbated by the fact that much of the projected energy demand growth will be in areas of the country, like New Mexico and the Southwest, that already have limited fresh water resources. The roadmap will identify the research, development, and technology demonstrations needed to ensure that natural resources, such as energy and water, can be cooperatively managed so that water limitations in the future will not negatively impact energy supplies.

- *Development of innovative decision support and modeling tools to improve water management.*

Sandia is assisting local communities and government agencies along the Middle Rio Grande in New Mexico in developing regional water management decision support tools to help these communities and agencies to determine how to best manage water use and demands in the Middle Rio Grande and assess long-range impacts of those decisions. These efforts have supported cooperation of a wide spectrum of stakeholders to evaluate numerous options and collectively develop a 50-year water plan for the region as well as support improved water routing and planning.

Sandia is assisting state and local communities and water resource managers in developing a regional water-management decision tool for the Gila River in New Mexico. This decision tool will enable local and state agencies, along with local water users to develop a shortage sharing and water banking mechanism to minimize economic and social disruptions during low flow or drought conditions.

Cooperation with federal, state, and international agencies is focused on developing new modeling tools for water resources management and conflict resolution for the Willamette River in Oregon, the lower Rio Grande, and the Jordan River in Jordan. These efforts will provide user-friendly tools that allow all stakeholders to rapidly look at various options and identify appropriate management strategies. The tools are being designed to help minimize regional conflicts over limited water resources, especially in times of drought.

In conclusion, we know that drought is a problem that is always going to be with us, but we do not have to accept the social dislocations and economic hardships that a drought can create. In the short term, we can manage our water resources better than we do now to be sure that there is enough water for people, their livelihoods, and for the environment. In the long term, our focus is on developing technologies that actually increase the amount of water available for our use. This new water can then be directed to the most appropriate activities, matched to the quality of water produced. The key to Sandia's water strategy is to focus research, development, and technology transfer on critical needs, beginning now and continuing forward as the current drought is alleviated so that we do not have to deal with ever-escalating crises in the future when drought conditions return.

Our vision of the future is built around wise use of water resources and the research and development of technologies that will "create new water". The good news is that New Mexico has lots of water. The bad news is that much of it is brackish or otherwise unusable. Our success and our survival in the future may depend on how well we are able to find technologies to help us exploit potential resources and to effectively manage the growth of competing water resources demands.

The CHAIRMAN. Let me start right with you, while you're there, Mr. Hightower. Just a few years ago, Sandia didn't have much to do with water research. It's not in its mission. It's not in its charter. But as a result of some work that started, I think, with arsenic, you now have established quite an effort within the laboratory to help us; is that correct?

Mr. HIGHTOWER. Yes, sir.

The CHAIRMAN. And what do we call that?

Mr. HIGHTOWER. We're calling it Sandia Water Initiative.

The CHAIRMAN. Water what?

Mr. HIGHTOWER. Just Sandia's Water Initiative. That's our terminology for it. And I think—

The CHAIRMAN. That's fine. And let me ask a question about this center. There is a center in the Tularosa Basin that's going to be located outside of Alamogordo. As we know, there's a huge basin. The Tularosa Basin is a huge underground basin. This center that's there, we have built and paid for with pure Federal dollars. Bureau of Rec has managed the construction of it. You all are involved in the technical operation of it.

Just in a nutshell, what is a center like this? Is it a place where people go to do research on technologies that might work, or what is it?

Mr. HIGHTOWER. The way we've designed this center in cooperation with the Bureau of Rec and USGS and many water utilities in the Southwest, it's designed specifically to look at the issues associated with desalination of brackish groundwater in rural communities. And that means brackish groundwater has a different type of chemistry than other types of seawater. It's more difficult to treat.

Also, economies of scale don't exist in many cases in small rural communities, so we have to look at economies of scale and new technologies that can address those issues.

And a third issue that you have in inland areas is to address the concentrate management issue that you get when you treat brackish water. There's a concentrate that has to be dealt with in an environmentally and ecologically sound manner.

So this research facility is designed to address all of those types of research. It's a user facility, it's set up to do both regional research and international research. There are very few inland desalination research facilities in the world. This will be the largest major research facility to address those types of issues. And those are the types of issues that we have to address in the State of New Mexico and in the Southwest to be able to use the brackish resources that we have.

The CHAIRMAN. Mr. D'Antonio, is the facility down there something you're aware of?

Mr. D'ANTONIO. Mr. Chairman, yes, it is. We work closely with Sandia Labs in a lot of different initiatives. It's something that we're extremely interested in, applying that inland technology throughout New Mexico and just looking for the cost associated with producing brackish water to come down so that it's economically viable.

The CHAIRMAN. Are you on top of the issue of what is going to happen to all that water if and when we find out we're going to

use it? Are we going to have a big battle as to who owns it and who can use it and who has to pay for it?

Mr. D'ANTONIO. Mr. Chairman, one of the issues that's associated with it is the point of diversion. We had an application before my office a couple of years ago, a point of diversion. There was a request for a 10,000—or application for 10,000 acre-feet. But the point of diversion was located in an area where it actually caused some impairment issues to local areas. We can definitely find better locations and points of diversion to utilize that water, and one of my tasks, obviously, is to protect senior water rights status. So that application was partially approved for about 3,000 acre-feet of the total 10,000 that was asked for. And certainly we're going to do what we can with respect to impairment issues and protecting existing water rights.

The CHAIRMAN. I'd led off with this question because, while we're here in the midst of a drought, one of the things we said we would be looking for is new water, and one new water source may very well be the brackish water, if we can make it economic. And if that's the case, we're on the right track with this center and spending money to try to lead the world, and we just can't wait around and watch them develop it at seawater, because it's not going to be the same technology. We're going to have to work our own for inland brackish.

I'm going to yield now to Senator Bingaman, and I'll have some follow-ups with you, Mr. Secretary, after he's finished.

Senator Bingaman.

Senator BINGAMAN. Thank you very much to all of you and thanks for your testimony. Mr. Limbaugh, let me just ask about this Water 2025. Obviously, I support the goals of that program, and I think all of us do. Frankly, I have been somewhat concerned, though, that the way we've been implementing this in budget requests to the Congress, there has been something of a robbing-Peter-to-pay-Paul kind of aspect to it. As I understand the fiscal year 2007 budget for water that was submitted by the administration, you're asking for \$14.5 million for Water 2025 at the same time you're proposing \$24 million in cuts for similar programs. Am I missing something there? I mean, you add \$14.5 million, and you cut \$24 million. You come out in the hole.

Mr. LIMBAUGH. Well, Mr. Chairman, Senator Bingaman, I'm not familiar with exactly where the \$24 million came up from, which programs. But in our budgeting process, we make a lot of tough decisions based on complexities of situations dealing with some programs. We look at where priorities can be set, and we also look at performance. And one of the things in budgeting for Water 2025 in fiscal year 2007 was that we saw the performance is there. And we also saw some tremendous results for the dollars that are spent, and the fact that it's hitting the ground and helping communities that we're sitting in today, with their water problems, dealing with it themselves in partnership, not as a Federal program that's throwing dollars at something, but as a focused, well-thought-out, competitive program, that the best projects rise to the top and are funded 50 percent, so you have the local engagement and ownership in those projects, bringing relief to some of these communities

that are affected by drought, and other pressures, like burgeoning populations and the Endangered Species Act.

In dealing with that, my background is farming and ranching, but it's also water management. I was a water master in Idaho dealing with droughts much like what you have here, although probably not that bad. But what we saw was 100-year-old infrastructure that just couldn't keep up and deal with all of the pressures of today.

So any dollars that can be put on the ground to help rebuild and modernize these facilities, so water managers can make good decisions, they can move water around more efficiently, they can conserve water in their operations and thus create maybe some peace, and maybe bring some people to the table to meet unmet needs in some of these watersheds where we think there may be problems down the road.

Senator BINGAMAN. Let me ask you also about the situation here in the Middle Rio Grande, something Senator Domenici spent a lot of time on, and I have also focused some attention on it. I have been urging that the Department put together a strategic plan and develop a multiagency budget to address this water issue in the Middle Rio Grande. We're concerned, of course, that compliance with this 2003 biological opinion could turn out to be very expensive. I think your own estimate is it could cost \$230 million—that's a figure that I have seen—and yet we haven't been able to get the Department to give us a strategic plan or a cross-agency budget, and, in fact, the requested budget for the various agencies to do work here in the Middle Rio Grande has suggested cuts. And that's for Bureau of Reclamation, Fish and Wildlife, U.S. Geological Survey, and the BIA.

What is your thought on this? Does it make sense? Is there a reason why an overall strategic plan doesn't make sense here?

Mr. LIMBAUGH. Mr. Chairman, Mr. Bingaman, it does make sense, and I have actually been personally working within the Department to bring that strategy to light. A lot of coordination is done on the Middle Rio Grande project. Jennifer Gimbel, from the Secretary's office, has been involved for the last 3 years to try to bring some coordination to that, and it's just a matter of getting a better line of communication with your committee, and getting this out so we can communicate this plan, that we have the strategic—look at how we're going to make these commitments and work through these issues with the endangered species on this river. I certainly am willing to work with you and your staff, as well as the Chairman's staff, to ensure that all your questions are answered, and that we do have a strategic plan in place.

Senator BINGAMAN. Thank you for that. I think, Mr. Chairman, this may be something we want to visit with Governor Kempthorne about. You have a hearing next week, I believe, on his nomination.

The CHAIRMAN. That's right.

Senator BINGAMAN. He may be interested in trying to do something on this. I hope that that's the case.

Let me just ask also—maybe Mike Hightower, let me ask you about all of this work on desalination, desalination of brackish groundwater. It assumes that we have a good idea of the extent of the brackish groundwater in these underground aquifers. It's been

my impression that we don't have a very good idea. We haven't done a very good job yet of mapping the underground aquifers along the U.S./Mexico border, and I put a bill in now for a couple of Congresses to try to get that done more effectively.

What's your assessment as to whether we should also try to get Geological Survey—working with others, perhaps—to do a better job, a more accurate job of mapping the underground brackish water aquifers that we have here in the State?

Mr. HIGHTOWER. The last major study that looked at brackish water in the State of New Mexico was done in 1972. And that was an effort associated with the old Office of Saline Water to try and assess brackish water in a general case. So as we are—in these situations where we're looking at brackish water more and more heavily, I think that there's a lot of additional information that we're going to need to be able to utilize that resource effectively.

So I do agree with you that we need to go in and do a better job, at least in the beginning, with the number of basins that look like they will be the basins that would be used for supplementing fresh water supplies, and get better characterization data, both safe yield data, aquifer property data, pumping data, that can all be used to help cities and communities identify exactly what their wellfields are going to have to look like, what kind of costs those are going to be, and what kind of information that you can use to support an application to the State engineer to use that water.

So yes, sir, I think that a better job of characterization of some of the major brackish aquifers in the State is very much warranted.

Senator BINGAMAN. I'll stop with that, Mr. Chairman.

The CHAIRMAN. Well, Senator Bingaman, let me just say, I'm not sure that Mr. Hightower is the right person for me to pose the question to, but I will pose it for the record, and we will get it answered.

Mr. HIGHTOWER. It could be the wrong answer.

The CHAIRMAN. We need to know soon whether your question should be answered in the affirmative. And if it is, we have to find out why we shouldn't do it. And if the answer is that we should, then we'd better do that. I mean, we are spending a considerable amount of money for the Center to be built when it costs—it slips me. Does anybody remember what the cost is?

Mr. HIGHTOWER. \$16 million.

The CHAIRMAN. \$16 million just for it. The Navy spent \$29-\$30 million there on Tularosa Basin with one of its experiments. So it seems to me, if we're doing that, we might be looking at that resource as something valuable, we ought to know more about its condition; right? What is it? How deep is it? I think we know a little more than this little conversation would indicate.

Mr. HIGHTOWER. The Tularosa Basin is probably the best characterized aquifer. Tularosa is fairly well characterized. But there are other aquifers, the Estancia Basin Aquifer, that people are looking at.

The CHAIRMAN. Which one?

Mr. HIGHTOWER. Estancia.

The CHAIRMAN. Very good. We ought to look at that.

Mr. HIGHTOWER. Aquifers by Gallup that are not as well understood.

The CHAIRMAN. I didn't even know they existed. Are they very good? Are they usable?

Mr. HIGHTOWER. There are some. There are some issues with safe yields associated with that.

The CHAIRMAN. But they could be?

Mr. HIGHTOWER. Possibly. There are some brackish aquifers on the east side, from Hobbs all the way up through Tucumcari that—

The CHAIRMAN. I think we're going to pose the question here for the record, and whichever entity is appropriate is going to answer that for us, and we're going to put up some money and get it done in an orderly manner. We're not going to just say, everybody has to—it has to be done, but in a manner that's consistent with some sense of realism.

Having done that, let me say there are plenty of additional questions, but let me just do one here for Mark, for the secretary.

As you're aware, New Mexico is facing this terrible drought and we included in the Emergency Supplemental Appropriation Bill a provision to authorize the Bureaus of Emergency Drought Assistance Program for 2010 and to fund that program at \$7.5 million. Do I have your assurance that you will use this authority and the funds provided for emergency drought assistance to help New Mexico through this tough time? And do you believe the \$7.5 million is adequate and will help us significantly through these difficult times? And what else might we do to assist New Mexico during this time?

Mr. LIMBAUGH. Well, Mr. Chairman, first of all, on the adequacy, I believe \$7.5 million will go a long way. You know, as far as some of the capabilities of the Bureau of Reclamation, I think it does cover the things that we believe we have to do to not only get through the drought for the endangered species issues, but also to assist some of the communities that are having some very dire problems right now.

The CHAIRMAN. All right.

Mr. LIMBAUGH. You do have my commitment to work within the authorizations of the act as you have extended title I of that act. Obviously, the only permanent things we can do are drilling wells. They are an emergency basis. I believe the State of New Mexico has a drought mitigation plan in place. We do not need a Governor's request. It's in the—I think it's in the record, and so we can move forward. But I will double-check on that to make sure we don't get the red tape in the way of meeting the needs of the State.

As far as other things, again, I think the 2025 projects are helping a lot. I think it's hard to—once you get them in place, it's hard to simply continue to point our finger at those things, saying they're very useful, but they are. And we need to continue to look at our aging infrastructure and improving that for the future.

The CHAIRMAN. Mr. Otero, it's my understanding that you're going to receive an additional \$1 million in 2025 grant money this year.

Mr. OTERO. Yes, sir.

The CHAIRMAN. What are you going to do with that money, and what kind of savings do you anticipate are going to result from that?

Mr. OTERO. Can you answer that?

Mr. GROGAN. Yes, Mr. Chairman. Senator Domenici, thank you. We anticipate carrying on with the plan that we've developed with the Bureau of Reclamation for further improvements to our metering program, additional water control devices to improve water management, and we have recently begun a large-scale effort to examine the feasibility and the potential for lining some portions, some limited portions, of our canal system. We don't want to go into that in a big way yet. We're not convinced of the savings, but we are working with the Middle Rio Grande Endangered Species Collaborative Program and some other entities to see if there might be some savings available to us there.

The CHAIRMAN. That's good. Senator Bingaman alluded to the endangered species in the biological opinion, and we won't scratch the surface on what has taken place over the last 4 years in an effort to resolve this issue. It's just been an enormous effort. I look back on it and say, I just cannot believe how much time and effort and resources it has taken to get us through these difficult times. And the ESA, the agreement between all of the stakeholders—the institutionalizing of the stakeholders, which we have done by statute through appropriations once, and then we have a bill introduced that's being held up by WRDA that would make a permanent board and permanent voting for the members.

You know, we have the Secretary of the Interior involved in this basin, as far as the minnow, in a way that you would not imagine. They are there on the ground trying to solve this. And Senator Bingaman alluded to the cost to implement what we've got to preserve the minnow and keep the water flow. Assuming everything else goes, we'll have spent over \$200 million in the next decade. The public doesn't know that yet. That's the first allusion to it today, \$235 million. They love the minnow, but when they see the price tag, they begin to ask questions. It's going to be very, very expensive. I'm hopeful that we don't get into serious arguments about it, but who knows? I could not have spent more time and effort or put more staff time in any project. And you know that, Senator. And it is tough. And it is part of this issue. It doesn't sound like it should be here, but it is, as if we have a new person, new entity that uses water—to wit, the fish—so in that context, it's part of the issue that we have here.

So let me say to the Middle Rio Grande and to you, Mr. Chairman, I have read recently that you and the board have made a commitment to work with the Bureau of Reclamation and the Corps of Engineers to meet the requirements of the Endangered Species Act, ESA, the collaborative agreement, that we have ongoing; is that correct? I see the board members here. I'm sure that's correct.

Mr. OTERO. It is.

The CHAIRMAN. Is that correct, Mr. Chairman? Because we can't do it without you. It's impossible.

Mr. OTERO. Thank you.

The CHAIRMAN. I have no further questions. Do you, Senator Bingaman?

Senator BINGAMAN. No, that's fine.

The CHAIRMAN. Could I ask—this is unusual, but I think I'll do it. There are lots of people from the press here. We're finished with

our witnesses. We're not going to let the witnesses inquire of the senators. That would be very unorthodox.

[Laughter.]

The CHAIRMAN. And I didn't ask Senator Bingaman whether we could or not. He would probably say yes, anyway. But let me say, if the press would like to ask a couple of questions, if they have any, we'd be glad to take a few right now. If not, we're going to adjourn, and thank the Cultural Center for this room.

Anything? Any questions from anybody? OK. There was one out there. Yes, ma'am.

SPEAKER. I just had a question for Senator Bingaman. I was wondering, could you elaborate on the \$24 million in cuts that you had mentioned?

Senator BINGAMAN. Yes, I sure will. Let me just cite for you the areas where those cuts have occurred, because I'm informed the cuts have been in four areas: One, in the Science and Technology Desalination Program; second, in the Water Management and Conservation Program; third, in the Native American Affairs Program; and fourth, in the water reuse projects. So when you add up the cuts in those four categories, it gets you to \$24 million.

The CHAIRMAN. And you know, I don't have it in front of me, but the Corps of Engineers didn't get the increases that it should have gotten. We have to find some money there, too. There isn't any question the water programs never get treated very well, but the four that were mentioned, at least a couple of them have not been treated that poorly in the past, so we're going to have to make up a little bit by finding some moneys elsewhere. And that will be my job, to try to help some, rather than to let it get cut that much.

I don't disagree that the choice must have been made that 2025 has more bang for the buck than some of this, in the opinion of the OMB presented to the President. That happened. And of course, Senator Bingaman is indicating he doesn't like that, and that's obvious. I surely don't like it, either, but I can't do much about it at this point. I still want to do 2025, despite the fact that they haven't done as much as they should in the other areas.

Anything else? All right. It's been great being with all of you. We'll be in recess. Thank you.

[Whereupon the hearing was adjourned.]

APPENDIX

RESPONSES TO ADDITIONAL QUESTIONS

RESPONSES OF R.B. (RANDY) WHITE TO QUESTIONS FROM SENATOR DOMENICI

Question 1. You mentioned that some farm program such as the Livestock Assistance Program, have been helpful but that some of the Conservation program divide property rights. Can you go into a little more detail about your concerns about the Conservation programs?

Answer. Under the current Farm Bill, there are substantial funds earmarked for conservation programs, while there is no money earmarked for disaster or drought assistance programs. When there is a disaster or a drought, and in the arid Southwest we know there will be drought, funding must be approved by Congress and assistance is provided after the fact. Sometimes years after the fact. There needs to be money in the Farm Bill readily available for livestock producers facing weather related adversities as they occur. We know that there will be drought in the Southwest, it is just a question of when. It can be argued that drought management and funding are conservation measures.

There are various conservation funding segments in the Farm Bill making millions upon millions of dollars available to those who can take advantage of it. Unfortunately not all producers are in a position to participate in these programs. Many of the programs require cost-shares that, especially during a drought, are not affordable. Others simply provide matching money for an unrelated third party to purchase and severe development rights to guarantee that the land will stay in agriculture into perpetuity. These programs can, and often do, provide a cash injection into an agricultural operations and they are a necessary tool. However, I cannot plan into perpetuity and I don't know anyone else who can either.

I would rather see stable and readily available funding for disaster and drought assistance place in priority ahead of these conservation programs and more work done to support a health agriculture economy rather than land use planning.

Question 2. With respect to grazing on Forest Service and BLM lands, you mentioned that the drought is causing agencies to remove livestock rather than implement workable solutions to get through the drought. From your perspective, what might some workable solutions that the Forest Service and BLM could implement?

Answer. While New Mexico is continuing a long term drought, many parts of the state experienced significant moisture last year resulting in excess forage early this year. The Forest Service could have let allotment owners on the ground early this year to allow that forage to be grazed, rather than letting it sit as fodder for catastrophic fire as it has for the past few months.

Additionally, the Forest Service has been inflexible in allowing allotment owners to supplementally feed cattle on allotments as necessary to maintain body condition and to care for the land. The agency also does little to nothing to assist producers who can no longer use their allotments to locate alternative grazing, often resulting in the sale of livestock. As the state's elk population, the elk are grazing ahead of the livestock leaving no forage for the ranchers who have paid a grazing fee for that forage. Admittedly, the elk are a state issue, but we have been unsuccessful in getting the Forest Service to work with the New Mexico Department of Game & Fish to address the issue.

Finally, the work load created by federal environmental laws and law suits have left the federal land management agencies unable to address the monitoring that is necessary for prudent land management. Because they do not have the data on which to base decision-making, they are cutting livestock numbers to avoid further litigation. Additionally, they are continually seeking subjective decision-making processes, rather than relying on the traditional objective processes.

RESPONSES OF LARRY F. PERKINS TO QUESTIONS FROM SENATOR DOMENICI

Question 1. I'd like to better understand how our drought relief programs are working. Have you and your family been eligible for, and received, any drought relief over the past 5 years? If so, from which programs?

Answer. We have been eligible for some FSA drought programs.

The FSA Nap program (drought insurance on non-program crops) and the cattle program offered in 2003 (I forgot the program name but it had to do with having to sell livestock that you normally would not sell.)

Question 2. You mentioned that your groundwater table has dropped 20 feet over the last 5 years. Given the lack of surface water in your area, are the costs of pumping water for irrigation needs now so high that it is uneconomical for farming operations in the area? Is that primarily a function of high energy costs, or has that just exacerbated the problem?

Answer. We are in a area that has very few wells that produce enough water to irrigate with. This is the main reason we have been hit so hard by the drought. Our only source of irrigation is from surface water held in Conchas Reservoir, and delivered to our district through a canal system. Therefore I would have to say that the cost of pumping is not a big issue in our area. I can say the few wells we have (4 or 5) they have not pumped due to the cost of pumping and the low volume of water they can pump (between 200 and 400 gallons/minute).

[Responses to the following questions were not received at the time the hearing went to press.]

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

Hon. L. RAY NUNLEY,
Mayor of Ruidoso, NM.

DEAR MAYOR NUNLEY: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. Your community is facing many hardships this year due to the drought and from your testimony, it's obvious that you're looking at all options to conserve water and manage it more efficiently. Are there some specific options that should be an immediate priority such as drilling an emergency well?

Question 2. I toured a watershed thinning project in your area in February. Has that project, and similar efforts helped reduce the risk of fire to the Village of Ruidoso or are there some areas that are still of particular concern to you?

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

MICHAEL HIGHTOWER,
Sandia National Laboratories, Albuquerque, NM.

DEAR MAYOR HIGHTOWER: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. Given the population projections in your testimony, it's clear that expanding the useable water supply, along with conservation and better water management, are key to addressing our future water needs. As you note, New Mexico has lots of water but that a large part of it is brackish or otherwise unusable. Just the number you provided for the amount of "produced water" from the oil and gas fields is astounding (25 billion gallons/yr). How close are we to developing cost-effective technologies for using produced water or desalinating our brackish groundwater? Is there a consensus as to what the priorities should be for research at the Tularosa Basin National Desalination Research Center? How is it anticipated that the research will be funded?

Question 2. Over the last decade, there has been a significant increase in water reuse projects. Albuquerque, El Paso, and many communities in California have implemented projects. Are there still improvements to be made in water reuse technology—or should most of the research priority be focused on desalination?

Question 3. You note that Sandia is conducting research to quantify the impacts of salt-cedar removal on water availability and reservoir sedimentation. Is this research being conducted by working with other entities such as the Soil & Water Conservation Districts to evaluate some existing salt cedar removal projects? When will the findings of this research be available?

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

ALVIN S. TRUJILLO,
Executive Director, Navajo Nation Division of Natural Resources.

DEAR MR. TRUJILLO: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. Reading your testimony, I'm encouraged by the progress you've made in many areas. In particular, I'd like to congratulate you, and everyone else involved in the San Juan River Shortage Sharing Agreement. That agreement has been very significant in helping Northwest New Mexico get through this period of drought. Your testimony, though, is also somewhat overwhelming in describing the number of water issues still facing the Navajo Nation. You mentioned that over 30% of Navajo households must haul water to meet their daily needs. Can you give an estimate of how many people this 30% figure represents? Do you know how many of these households are located in New Mexico?

Question 2. In preparing your drought response plan, are some of the public water systems that supply those hauling water at significant risk this year?

Question 3. What has been the effect of increasing gasoline prices on those households having to haul water?

Question 4. You also mentioned that the Navajo Nation has identified a number of economic development centers on the Reservation. Will the proposed Navajo-Gallup pipeline project serve one or more of these economic development centers? If constructed, will it help address reduce the number of households having to haul water?

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

JOHN D'ANTONIO, P.E.,
New Mexico State Engineer.

DEAR MR. D'ANTONIO: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. The State is putting in place a lot of progressive water management strategies that will benefit all water users over the long-term. You deserve a lot of credit for that. For the short term, though, what programs does the State have in place to help provide immediate relief from the effects of the drought? For example, how can the State help secure water for Ruidoso?

Question 2. Your testimony mentions the "Active Water Resource Management Program". Can you provide some specifics as to some of the water management tools that will help you implement that program?

Question 3. Last year, the Legislature authorized and provided funding for the State to create a "Strategic Water Reserve". I know that in the middle of this thought, it's hard to think of times when we'll have excess water to put in reserve. But do you envision that Strategic Water Reserves will play a significant role in helping to address future water shortage situations, and ensure that water is available for environmental needs in a manner that minimizes the impact on water users?

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

BRUCE KNIGHT,
Chief, Natural resources Conservation Service, Department of Agriculture.

DEAR CHIEF KNIGHT: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. Your testimony indicates that drought conditions are expected to persist through June 2006. What does the NRCS use as the basis for analyzing and predicting drought conditions? Based on the current tools you have in place, how far into the future are you comfortable making predictions about drought conditions?

Question 2. You also mention that 80% of the streamflow in the Western U.S. is derived from melting snowpack. The Western States Water Council is developing a "Water Action Plan for the Western States". One of the concerns they have raised has to do with the ramifications of climate change on western water supplies. They note that there is already evidence of (1) smaller snowpacks and more rain; (2) ear-

lier snowmelt; and (3) more evaporation and dryness in our soils. Do you agree with those findings? If so, what are the implications for the West given that streamflows are so reliant on melting snowpack.

Question 3. NRCS's water supply forecasting programs are very valuable to water managers and water users. What are some of your priorities in expanding the data-gathering capabilities of the program to increase its accuracy and capabilities?

Question 4. You talked about the Ground and Surface Water Conservation (GSWC) component of the Environmental Quality Incentives Program (EQIP). Do you have figures on how much GSWC funding has been available in New Mexico since the 2002 Farm Bill? Are there any water banking or groundwater recharge projects currently in the works in the State?

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

Hon. MARK LIMBAUGH,
Assistant Secretary for Water and Science, Department of the Interior.

DEAR MR. LIMBAUGH: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. As your testimony notes, crisis management is not an effective response to drought, and water 2025 is intended to allow Reclamation to take action in advance of a water supply crisis. For several years now, I've been trying to get the Department to put together a strategic plan and develop a multi-agency budget to address systemic water issues in the Middle Rio Grande one of the designated hotspots under water 2025. Obviously, my goal is to avoid a conflict that might occur soon, particularly due to this drought. The Department has not yet responded to my requests, despite the fact that by its own estimates, compliance with the 2003 biological opinion will exceed \$230 million. In fact, this year's budget proposes an overall 17% cut for the Middle Rio Grande programs of the Bureau of Reclamation, Fish & Wildlife Service, USGS, and BIA. While there are some good water 2025 projects, I also see grants being used to install water meters in urban areas—which causes concern if those projects are considered a higher priority than the Middle Rio Grande. What criteria is Reclamation applying to prioritize its water 2025 grants?

Question 2. I'm concerned that a strict 50-50 cost-share formula for the water 2025 program will preclude some smaller financially-strapped entities from participating in the program. Your testimony, in fact, notes that the thought program may be the last resort for these communities. Do you believe this is a valid concern, and how might it be addressed in the legislation?

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, May 1, 2006.

JOSÉ OTERO,
Chairman of the Board of Directors, Middle Rio Grande Conservancy District.

DEAR MR. OTERO: I would like to take this opportunity to thank you for testifying before the Senate Committee on Energy and Natural Resources on Wednesday, April 19, 2006, to give testimony regarding the record low snow pack and drought conditions facing the state of New Mexico.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Friday, May 12, 2006.

Thank you in advance for your prompt consideration.
Sincerely,

PETE V. DOMENICI,
Chairman.

[Enclosure.]

QUESTIONS FROM SENATOR DOMENICI

Question 1. I'd like to congratulate the District on the efficiency improvements made to your infrastructure over the past several years, and the efforts you've made to work with the federal and state agencies to help avoid conflict between water users and the Endangered Species Act. I've been concerned that the current drought will make it very difficult to avoid a crisis—particularly next year when we have little storage in the reservoirs, and the Rio Grande Compact will preclude New Mexico from storing upstream even in an average water year. Given that the water the District provides for its farmers is the same water that helps meet the target flows for the biological opinion, do you have similar concerns about the likelihood of a crisis in 2007?

Question 2. Your testimony highlights the fact that the District has reduced diversions of water from the Rio Grande by almost 40%. This is impressive. It also appears that you've been able to conserve your stored water for the benefit of both the farmers and the environment. As you know, I'm interested in developing a detailed long-term strategic plan for the Middle Rio Grande, of which the District would have to be a key player. Is there a way to formalize how your improved efficiency will yield benefits to the river environment? For example, if a conservation pool or water bank were one day established to help ensure compliance with the ESA, do you think your improved efficiency may allow the District to provide water to that pool, assuming that we eventually get relief from the drought?

Question 3. Is the District working with the Pueblos it serves to help them also improve their systems and become more efficient?

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